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ECONOMIC CONDITIONS IN THE PHILIPPINES

BY

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ASSISTED BY

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Not only does man come to possess a greater amount and variety of wealth as he becomes more civilized,[1] but he is less and less dependent upon nature and more and more dependent upon his fellow men. The lowest form of human being that can be imagined is one whose only activity is the procuring of food, and who wanders about alone, living on worms, slugs, roots, twigs, and such nourishment as he can obtain without the assistance of implement or tool of any kind. Such a human being is not known to exist. All men so far encountered live in groups, understand fire, and possess certain implements which assist them in obtaining their living. Search for the necessities of life and the desire to obtain them with the least effort possible have caused such groups to evolve systems by which these necessities (wealth) are produced, exchanged, distributed, and consumed. The more complicated the system, the greater the wealth, and the greater the surplus over the bare necessities of existence.

Greater complication of the economic system with advance in civilization is well illustrated in the tribes under discussion.

Of the most lowly of known human beings the Negritos are a good example, and even among these people we see the beginnings of a system; there is a division of labor between the sexes by which, in general, the men do the hunting, and the women the gathering or growing of vegetable foods. There is also some idea of division of wealth among them, as shown in the distribution of the carcass of an animal killed in the chase.

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of the air we breathe; the value of water is the utility of the water we drink or wash in or cook with; but, although this utility is very great, neither air nor water can be exchanged for other articles. Hence the definition of wealth previously given must, from an economic standpoint, be qualified to exclude those things which have no value in exchange. *Wealth consists of those things which help man to live and have value in exchange.* Economics is the study of wealth.

[1] The term "civilization" is a complex one and is usually interpreted to include government, literature, art, morals, besides food, clothing, shelter, amusements, and the like. Within the scope of this book, however, the term "civilization" refers only to the material or economic advance.

the coöperation of several persons in the Bureaus of Education, Customs, Internal Revenue, Science, and Public Works. The data furnished by Mr. Conrado Benitez of the University of the Philippines, Mr. Herbert W. Krieger, of the Philippine School of Commerce, and others are also duly acknowledged in the proper places.

The manuscript was reviewed at the University of California by Professors David P. Barrows, Carl C. Plehn, and H. R. Hatfield, and at the University of Chicago by Professor Paul J. Goode.

Books which were consulted and from which extracts are taken are mentioned in the text or in footnotes.

H. H. M.

FOREWORD

In accordance with the present purpose of the Bureau of Education to adapt its instruction as closely as possible to the life needs of the people of the Philippines, a course has been introduced into the high-school curriculum embodying a half year of physical geography, a half year of commercial geography, and a full year's study of economic conditions in the Philippines.

This book is to serve as the text in the subject of economic conditions in the Philippines in the fourth year of the secondary course. It is not a theoretical treatise on economics; it rather represents a study of everyday facts with which all young men have to do who are engaged in any useful occupation in this country. In the last year of his school work, instead of devoting himself to purely academic studies, the pupil assimilates a body of information which tends to lead him into intelligent and useful citizenship. This is one of the richest and most interesting fields of investigation open to the Filipino student; it is a new field; it has never been covered heretofore in any adequate way, though all the facts involved have a very direct bearing upon the industrial and social welfare of the Filipino people.

The preparation of this book has involved many months' work by a large number of well-qualified persons. The dearth of publications on the various subjects considered has necessitated the gathering of original information from all sections of the Islands, and on this task approximately one hundred and twenty American and Filipino teachers have been employed. Under date of March 1, 1912, an outline prepared by Mr. Hugo H. Miller was sent out by the Director of Education to these collaborators throughout the Islands. The outline took up in detail various subjects treated in this book, and by questions and suggestions presented a plan for a report on the economic conditions found in each district. Selected supervising teachers and special high-school teachers were engaged upon this work. The nature of their ordinary duties is such that these persons must have a thorough understanding of the social and economic complexions of the communities in which they are working; they are better fitted than any other class of persons to furnish information of this character. The reports submitted are voluminous and in most cases exhaustive and accurate.

In the writing of this textbook Mr. Miller has had at his disposition all the data accumulated by the Bureau of Education in the working out of the program above referred to. He has brought to this task a breadth of view and a maturity of judgment resulting from several years' study of these problems from the vantage point of a supervisory position in the industrial department of the Bureau of Education.

Mr. Charles H. Storms, Instructor in the Philippine Normal School, was temporarily assigned to the General Office of the Bureau of Education to assist in the preparation of this book. He compiled material from the special economic reports, collected and arranged data from various publications at hand, criticized the manuscript and general contents, and wrote the chapter on sugar.

The completed text is an original and valuable treatise on a vital subject, and as the facts here presented are digested by the many hundreds of pupils who will devote themselves to their study, the book may well prove to be one of the effective agencies in the material upbuilding of the Philippines.

FRANK R. WHITE
DIRECTOR OF EDUCATION

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ECONOMIC CONDITIONS IN THE PHILIPPINES

PART I. INTRODUCTION

CHAPTER I

PRIMITIVE AND CIVILIZED PEOPLES

Approximately seven eighths of the population of the Philippines consists of a civilized people known as the Filipinos. It is with them that this book primarily deals.[1] However, the savage and semicivilized tribes, which make up the other eighth, offer excellent examples of various stages of economic advancement from one of the lowest known conditions in which the human race is found up to the present plane achieved by the Filipinos. It is therefore proper to begin a study of economic conditions in the Philippines with a short discussion of certain typical savage and primitive tribes. Their economic systems and ideas are so simple as to be readily understood, and a study of them prepared the way for a comprehension of more complicated systems and ideas of civilization. Moreover, the trading operations of these tribes with the Filipinos are of considerable commercial importance.

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[1] The names by which various groups, tribes, and divisions of peoples in the Philippines are designated are very loosely used. Strictly speaking, the term "Filipino" applies to all Malayan natives of the Philippine Islands. Popular usage, however, tends to limit the term to the eight Christian peoples, and within the covers of this book that usage will be followed. By the term "Filipinos," as used here, is meant civilized Christian Malayan natives of the Philippine Islands.

THE NEGRITOS

The most primitive people of the Philippines are the Negritos.[1] Most of them are found in the hills and mountains of several of the larger islands and on a few of the smaller ones. They probably do not exceed 30,000 in number. These people belong to the black race, and have a dark skin, kinky hair, thick lips, and flat nose. They seldom exceed five feet in height and are usually under that measurement. The Negritos live in groups varying from one family to several scores of persons. In most instances their contact with more advanced peoples has changed their original mode of living, but many of them still follow the primitive existence which has been theirs for centuries.

The chief and almost sole aim of the Negritos is food, and their method of obtaining it is such that they keep only a small supply or none at all on hand. They make small plantings of camotes, corn, and squash, but beyond this they usually have no idea of providing for the future needs of their stomachs, feeling that they can find food when necessity demands. The most primitive Negritos depend principally upon the chase as the chief means of securing food, and to a less extent upon fresh-water fishing. The men are the hunters. Their implements are bows and arrows, spears, blowguns, traps, nets, and bolos. They are assisted in the hunt by dogs, their only domestic animal. The women sometimes take the place of the dogs and assist in scaring up the quarry. When a deer has been killed a definite division of the carcass is made. The man who first wounded the deer receives the head and breast; the backbone is given to the man who discharged the fatal shaft; one hind quarter is given to the owner of the dogs that scared up the deer; and the remainder is divided among the other hunters. If a family kill a deer or a boar, "they halt at the spot where the animal has fallen, scoop a hole in the ground, place the animal in it, and then build a fire. Each one takes the piece of the animal that suits his taste best and roasts it at the fire. And so they go on eating until they have filled their bellies, and when thus satiated they sleep. . . . When they awake they go through the same operation, and so on until all the meat is devoured; then they set out upon the hunt again."[1]

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[1] See "The Negritos of Zambales" by William Allen Reed, Bureau of Science, Manila.

While the meat thus obtained in the chase is the chief food of most Negritos, they also have vegetable food. Much of this is found in the forest in the form of roots. A small amount is obtained through cultivation in "kaingin."[2] The ground is roughly cleared, and rice, corn, squash, and sweet potatoes are planted. Among the most primitive a few rude shelters are erected near this clearing while the crop matures; but such settlements are not permanent, and when once the food from the kaingin has been consumed they wander off. Indeed it sometimes happens (as in case of a death) that they leave before the crop matures. We have seen that hunting is the province of the men. The men also assist in planting, but cultivation is left almost entirely to the women and children. The implements used in agriculture are sharp, pointed sticks, with which holes for the seeds are made in the ground. Bolos are also employed for various purposes.

The clothing of the Negrito is very simple. The most primitive form is made from beaten bark. The men wear a breechcloth. The women sometimes use this garment, but usually they wear a short skirt.

The Negritos have simple implements to help them in procuring and preparing food. They manufacture pointed sticks for agriculture, and arrows, blowguns, and nets for the chase. They obtain fire with the flint and steel, or by rubbing together two pieces of bamboo, and cook in green bamboo tubes or in pots obtained in trade. Besides food and clothing they have bamboo combs and seed necklaces for ornament, and bamboo musical instruments for enjoyment.

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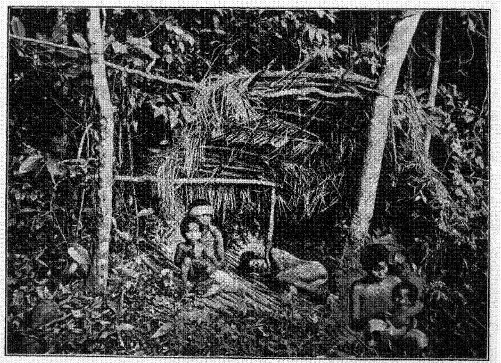
[1] See Buecher's "Industrial Evolution," p. 9. This is a quotation from A. Schadenberg in the *Ztschr. f. Ethnologie*, XII (1880), 143–144. Probably no Negritos now exist who do not cultivate crops in kaingin.

[2] Temporary clearings.

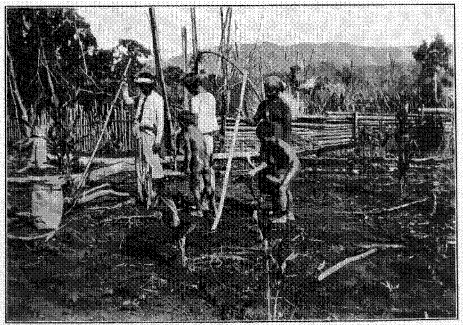
Migrating as they do from place to place, the most primitive Negritos accumulate but few articles. Bows and arrows, blowguns, traps, nets, and dogs they take with them. The meat of wild animals, the wild roots, and the product of their clearings, they must consume where they find or produce them. Permanent results of labor which cannot be easily transported, such as substantial houses, coconut palms, and fruit trees, are of no interest to the Negrito. In addition to providing themselves with the simple forms of food and rough implements and ornaments, many groups of Negritos have been able to acquire articles of iron and steel (bolos and spears). The cotton cloth which they use is obtained from the lowlanders, in exchange for forest products. The life of the Negrito may be summed up as "one continuous search for food."



A NEGRITO SHELTER

THE SUBANUNS

The Subanuns are a pagan Malayan tribe of the Zamboanga Peninsula in Mindanao.[1] As with the Negritos, but to a less degree, the chief aim in life of the Subanuns is food. Unlike the Negritos, however, they ordinarily produce their food rather than find it, and only resort to forest products when their crops fail. The food of the Subanuns is secured chiefly through agriculture. They follow the kaingin system. In the clearings they plant rice, sweet potatoes, corn, millet, yams, tobacco, vegetables, bananas, papayas, and betel vines. The Subanuns are not naturally of a roving disposition, but their implements of agriculture are not such as to enable them to cultivate the same clearings year after year. As soon as the ground hardens and the cogon grass obtains a foothold, their pointed sticks are useless, and they find it easier to abandon their field and clear another. This does not mean that they



PLANTING RICE IN A KAINGIN

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[1] "The Subanuns of Sindangan Bay," by Emerson B. Christie, Bureau of Science, Manila.

leave the locality immediately. As long as there is new forest suitable for clearing, they remain. But feeling the ultimate necessity of leaving, they do not plant long-time crops, such as coconut palms, areca palms, and the like (although they greatly enjoy the products of these), nor do they build houses of a substantial character. It is seldom that a Subanun family remains in the same spot for a period of more than ten years. It is usually much less than that time.

In clearing the ground different families of the community coöperate. In cultivating the clearing the men of the family to which the land belongs make holes with sharpened sticks, and the women and children follow, planting the seeds. Weeding is done twice, but the crops receive little cultivation.

While the Subanuns do but little hunting and fishing, they have a supply of meat in the two domestic animals — the pig and the chicken. They understand the fermentation of rice, and make a rice beer.

The clothing of the Subanuns is made from cotton and abaca[1] cloths. The men wear trousers and shirts, the women waists and skirts. Turbans are worn by both sexes. For ornament, silver trinkets, beads, earrings, necklaces of dried seeds, brass anklets and armlets, wristlets made of shells and silver, rings and earrings of wood, coconut shells, seashells, horn, and brass, as well as bamboo combs are worn, many of these being obtained in trade.

For shelter the Subanuns build houses of one room on wooden supports. The floor is made of split bamboo, palm, or wood, and the rest of the house of bamboo and light materials, such as the leaves of nipa, buri, sago, and other palms. The space beneath the floor is given over to the pigs and chickens. In the house are mats of pandan or palm leaves. The bedding consists of a few strips of cotton cloth. There are also baskets for storing food, pottery obtained in trade, brass gongs, and Chinese jars secured by barter from the Moros.

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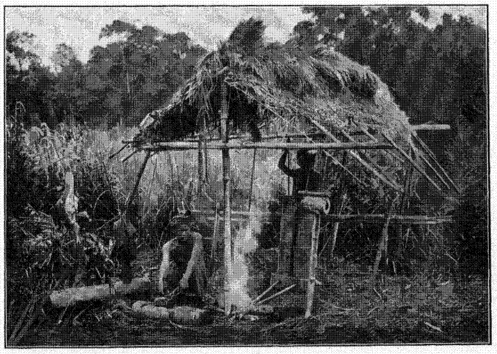
[1] *Musa textilis*, Manila hemp.

The Subanuns build rice granaries, which consist of large baskets erected on a platform and protected by a roof. In this way they store food to meet the future needs of their stomachs, and thus are not at the mercy of the vagaries of nature.

The Subanuns carry on manufacturing in a rude way. Pottery is made by women. The clay is formed by means of a stone, a stick, and the hand. The pot is first baked in the sun and then in a hot fire. These crude articles are often objects of trade. Coarse and unornamented baskets are made of nito,[1] rattan, bamboo, and wood. The garments worn by Subanuns are made from cloth woven by them. They understand the distaff and the spinning wheel, but the cotton worked upon these is obtained from the Moros, from whom they also buy cotton yarn. The abacá is entirely a home product. Their looms are very crude. The Subanuns also understand working in iron, using as tools bamboo bellows, an anvil (a piece of iron placed on a block of wood), and a hammer. The raw material



A PRIMITIVE SMITHY

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[1] The stems of climbing ferns (*Lygodium* spp.).

is obtained in trade, and from it chopping knives and a few weapons are produced. The Subanuns make musical instruments, rings, and combs from bamboo and wood. They also weave mats of palm and pandan leaves.

The civilization of the Subanuns has been greatly affected by barter with the Moros. The latter are much more advanced peoples, and by their trading relations have placed the Subanuns upon a higher plane. The Subanuns barter to the Moros mountain rice, wax, resins, and rattan in exchange for cotton fiber, yarn, and cloth; weapons; brass boxes, jars, trays, gongs, and ornaments of various kinds; and Chinese jars. The Moro traders arrive in boats, and the Subanuns bring down their products from the hills on their backs, as they have no beasts of burden, vehicles, or boats. Sometimes, however, they use rafts on the river. In these transactions the Subanuns are often badly cheated by the Moros.

The articles with which the Negritos are familiar are quickly listed, but those found among the Subanuns are much greater in number. The articles of daily use among the Subanuns consist of food (rice, sweet potatoes, garden vegetables, wild and domestic meats, fish, etc.), clothing of coarse cotton and abaca cloths, houses, crude baskets, and bolos. The implements used in production consist of pointed sticks, bolos, and knives, and the apparatus for ironwork and for spinning and weaving. The products saved for future use are chickens, pigs, rice stored in granaries, and corn stored in baskets. All these articles may properly be called "necessities," for, directly or indirectly, they all sustain life or shelter the body. The Subanuns also possess articles in no way related to their actual physical comfort, but which are kept for ostentation and future needs. Such are the silver, brass, shell, and bamboo ornaments for the body, the brass gongs, and the large Chinese jars. While these in no way protect or sustain the body, yet at any time they can be exchanged for wives, food, clothing, or shelter. In particular are the Chinese jars much esteemed, for these are beautiful and useful, and limited in number.

In the following points the Subanuns have surpassed the Negritos: (1) in obtaining a more permanent residence, which would be absolutely permanent if their rude cultivation could overcome soil hardening and weeds; (2) in securing improved methods of obtaining foods, and an increase in quality and variety; (3) in storing up a supply of food for future wants; (4) in their rude beginnings of pottery, metal work, and weaving; (5) and in their articles of art kept for ostentation and for future needs.

The life of the Subanun may be characterized as one in which agriculture normally gives a sufficient food supply and a surplus. The surplus is stored against future want or exchanged for articles of value.

THE MOUNTAIN PEOPLES

The Igorots, Bontoks, and Ifugaos[1] belong to the most advanced semicivilized Malayan pagan tribes. They live in the Caraballo Mountains, where the narrow flood plains and the steep hillsides offer but little fertile and arable land. Yet of their various forms of production these people are most advanced in agriculture — a condition which has probably been brought about by their restricted supply of wild foods. They clear the steep hillsides of pine trees, turn the soil with sharp sticks, and plant sweet potatoes, millet, or beans. Such fields are most often entirely dependent upon the rainfall for moisture and are usually abandoned after a few years' use. These people rely for their rice supply upon land made by building terraces on the steep hillsides and filling these with gravel, sand, clay, and soil. This is usually kept from being washed down the hillside by a thick retaining wall built of stone. Such walls are from 50 centimeters to 10 meters high, and in many communities amount to thousands of linear kilometers.[1] The human labor expended upon these terraces is tremendous. In places whole mountain sides are covered with terraces which contain thousands of hectares, and which are the results of generations of labor.

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[1] This discussion is based upon "The Bontoc Igorot," by A. E. Jenks, Bureau of Science, Manila, the economic report submitted for Ifugao by Roy F. Barton, and verbal information given by H. Otley Beyer, Bureau of Science. The Ifugaos and Bontoks live in subprovinces of the same names; the Igorots live in the subprovinces of Benguet, Lepanto, and Amburayan. Formerly the name "Igorot" was applied to all these tribes.

Several methods of irrigation are employed in these fields. Sometimes canals are fed by springs. Sometimes rivers are diverted into canals by means of dams and weirs, and the water thus comes to the terraces and flows from plot to plot, watering the whole mountain side. This work is done by communal labor and the water is divided among those who build the system. For small patches, where a flow is not obtainable, water is lifted from rivers by sweeps or carried in jars.

The implements of tillage employed by the Igorots and Bontoks are sharpened sticks, while the Ifugaos use crude wooden spades. These are quite effective in ground soaked and softened with water, and the soil is thoroughly broken up. It is then puddled with the feet. These people also understand the use of fertilizers, and add pig manure, ashes, grass, and sweet-potato vines to prevent impoverishment of the soil. Every two years they add new soil. The grain is sown thickly in a small seed bed and is transplanted in the terraces after it has sprouted. The cultivation of the fields is very carefully done. Women and children pull the weeds and thin out the plants. Old women and children protect the crops during the day, and at night fires are built to scare away wild hogs. The Bontoks and Igorots make scarecrows, consisting of bunches of leaves, figures of large birds, and the like. These are hung on poles and are often kept in motion by systems of strings attached to a float in a rapidly moving current.

In the rice harvest four or five cutters reap the grain and place it in bundles which one woman binds and carries to the transportation baskets.

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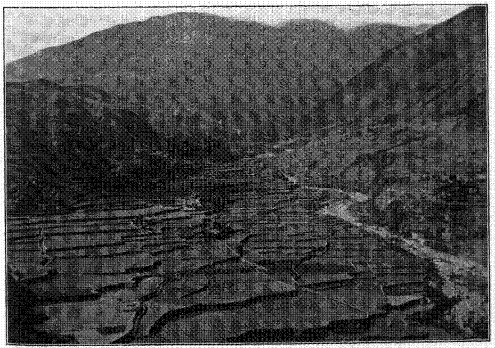
[1] In Ifugao there are over 19,000 kilometers of 8-meter wall.

A Kaingin



Rice Terraces

ADVANCE IN AGRICULTURE

Crop rotation is practiced, but not for the purpose of increasing fertility or retarding soil exhaustion; it is rather to make constant use of the land. The best example of crop rotation is the planting of sweet potatoes in the terraces after the rice has been harvested.

The system of agriculture as a whole is excellent, and such that the mountain people[1] wrest from their barren hillsides a supply of food which is more than sufficient for their immediate needs. In all villages there are granaries, built of heavy pine planks and timbers, with thatched roofs extending almost to the ground. Here the rice is stored. Corn and millet are kept in the dwellings. Beans are dried and stored in baskets. The Igorots also slice, dry, and store sweet potatoes.

These peoples are fairly well supplied with domestic animals. Horses of good breed are raised and used for riding and packing. Carabaos and cattle are also raised, but are used neither in agriculture nor in transportation. Their flesh, however, like that of the hog, is much appreciated. Hogs are kept in pens and are fed regularly three times a day with sweet-potato vines, parings, and green vegetable matter, always cooked. The refuse of the pen is the chief fertilizer. Besides these animals, chickens and dogs are raised about the house. The sources of food eaten by the Ifugaos have been calculated by Roy F. Barton as follows:

Food Source	Part of Total Subsistence
Agriculture	.84
Primitive food getting	.094
Animal culture	.042
Importation	.024
Total	1.000

The clothing of the men consists of a girdle of bast, rattan, or brass links. This supports a breech cloth made of bark or of

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[1] In this chapter the term "mountain people" refers to the Igorots, Bontoks, and Ifugaos as a whole.

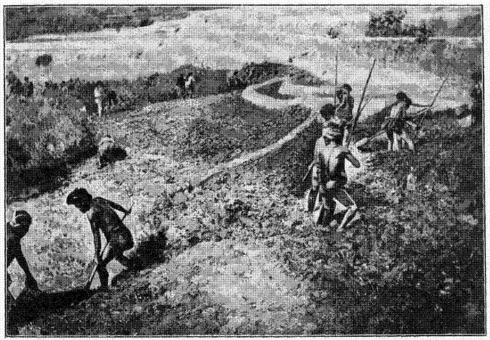


Photo by Roy F. Barton

TURNING THE SOIL

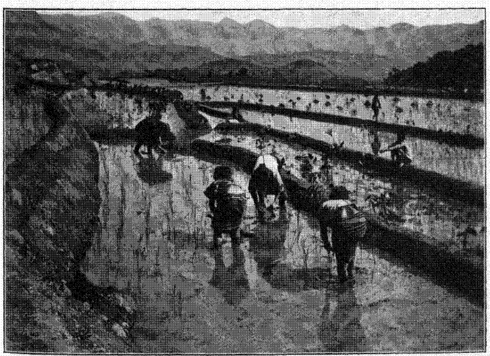
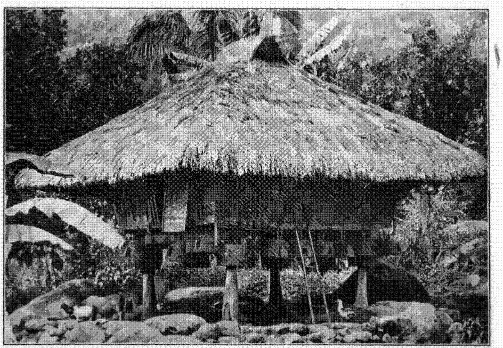


Photo by Roy F. Barton

PLANTING

RICE CULTIVATION IN TERRACES

cotton cloth spun by the women or obtained in trade with the Ilocanos. To this is sometimes added a light blanket worn when it is cold, as in the late afternoon or early morning. The Bontoks wear a small hat of basketwork, which is used more as a pocket than as a protection for the head. The Igorots wear a headband for the same purpose. The women wear a skirt, a girdle, and a waist, usually of cotton. Blankets are used by the women as well as by the men.



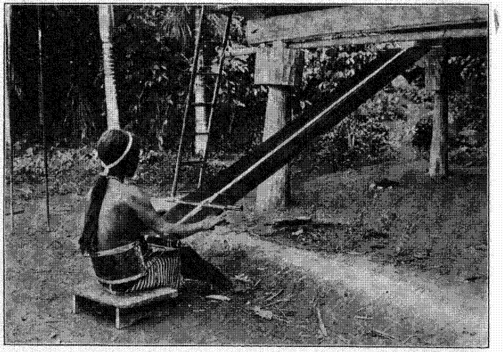
AN IGOROT HOUSE

The agriculture of the mountain peoples is such that there is no necessity for changing residence from time to time. Their houses are therefore much more comfortably and permanently constructed than those of the Subanuns. These are of two types — one built high above the ground upon large pine timbers, the other resting on the earth. The sides are of overlapping pine boards or of mud and stone. The steep-sloped roof is built of grass.

The manufactures of the mountain peoples are quite numerous. Stone is made into hammers, and also into troughs and bowls for pigs. All the men know how to make the crude agricultural implements. Wooden pails for the food of pigs, wooden dishes, bowls, dippers, and spoons for the household, and wooden shields and spears are also fashioned. Smoking pipes are often carved from wood. This work is done laboriously with knives and fire, and the articles are frequently ornamented with human or animal forms. The making of articles from metal, however, is confined to a few persons, for the reason that metal work requires considerable skill and experience. In the smithies two or three men work together. One operates the bellows, another feeds the fire and does the heavy striking during the initial part of the work, and the third, the real blade-maker, directs all the labor and performs the finer parts of the blade production. The iron used is scrap, obtained from the lowlands. The metal is hammered with a large stone hammer on a stone anvil and is tempered in water. In these smithies are produced several styles of spear blades, battle axes, and bolos. Nearly all Igorot towns make the clay

PRIMITIVE POTTERY MAKING

and wooden pipes locally used for smoking tobacco. A few men, however, gain a living by traveling from one town to another making pipes of brass. These men fashion a model of the pipe bowl in beeswax embedded in a jacket of clay. When the clay is baked, the wax melts and is drawn off, leaving a clay mold. Into this the molten brass is poured. Brass pipes are usually fitted with a stem of similar metal. Where suitable clay is found, pottery making is also carried on, and, as with the Subanuns, this work is left entirely to the women.



PRIMITIVE WEAVING

The bowls, formed with the hand and a stick, are sun-baked, then fired, and afterwards glazed with resin. Baskets, on the other hand, are made by the men. These are produced in numerous forms — some for storing food, some as winnowing trays, others as rice containers. One of the most important kinds of baskets is that used by the men for transportation.

A small amount of sugar cane is grown. This is crushed in crude mills, and the juice is crystallized in large iron boilers. It is also often fermented in tightly covered jars.

The drink thus made is known as "basi." "Tapui," or "bubud," a rice beer, is also extensively made and drunk. Several salt springs occur in this mountain section. The salt from the water is allowed to accumulate on stones, and is then washed off and the resulting brine evaporated.

Whetstones, flint, and clay for pottery are obtained by the Igorots, and to a small extent copper and gold are mined by them. From the forests they cut lumber for their houses, the logs being reduced to boards by means of axes.

It is interesting to note that in the raising of crops and the transformation of materials the work is divided. The older children gather food for the pigs and guard the rice terraces. The men cut the wood and lumber, build houses and dikes, construct irrigation dams, and transport the harvested rice. They manufacture and sell basi and produce implements and utensils for the house. They weave baskets and work with stone and metals. The women are the spinners and the weavers (for some cloth is spun by these people). They also prepare the seed beds and set out the rice plants in the terraces. They plant, cultivate, and harvest sweet potatoes, millet, corn, and beans, and assist the men in transporting soil. Some are makers of pottery and of salt. Both men and women thresh rice, carry water, and make the rice drink. The old people do the light work. They are the counselors; they guard the crops, attend the children, carry water, and do the cooking.

DIVISION OF LABOR BETWEEN SEXES IN IFUGAO[1]

MEN	WOMEN	BOTH
Spading fields	Planting rice	Cooking
Getting wood	Tending rice	Harvesting
All work in wood	Weaving	Care of baby
Pot burning	Pot molding	Carrying rice to granary
Blacksmithing	Gardening	Camote culture
Rice-field construction		
Basket making		

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[1] By Roy F. Barton.

Often a larger number of persons than is included in the family is needed to do a piece of work. In housebuilding and in much of the agricultural work, as in the building of new irrigation works, several families group their labor. The mountain peoples do not employ animals in tilling the soil, neither do they often employ them in transportation. Goods are carried on the backs of men and women.

Some of the articles manufactured by the mountain peoples are not produced in all communities. Thus, in Bontok, pottery is made by women of Samoki; salt comes from Mainit; battle-axes and spears from Baliwang and Balbalasan; clay smoking pipes are made in Agawa; whetstones are the products of Basao. These articles are disposed of by men from the producing towns, who, traveling in groups, take their wares on their backs to other towns for trade. The system is one of barter; that is, the men exchange their products for others obtainable in the different localities. Yet in all these transactions there seems to be a growing preference for the use of certain objects as a medium of trade. Particularly is this true of "manojos" (bundles capable of being grasped in the hand) of rice in head. The Igorots often pay for articles with these bundles. If they barter one article for another, they often estimate the values of these in terms of manojos of rice. To a less extent pottery, tobacco, and salt are used in exchange. More and more also the Igorots are employing silver and copper coins and even paper bills, but these are the result of a civilization higher than theirs.

In comparing the Subanuns with the mountain peoples, as we have below, we readily see points in which the latter have surpassed the former, and other points in which the two are on the same plane.

1. Though the implements of agriculture which the Igorots and Bontoks employ are the same as those of the Subanuns, the former have, through irrigation, succeeded in preventing the hardening of the soil and in keeping out weeds.[1] By the

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[1] The spades used by the Ifugaos are superior to the pointed stick.

use of fertilizers they have prevented exhaustion of the soil. Thus, being able to use the same piece of land constantly, they have achieved permanency of residence.

2. The mountain peoples have greater variety of food than the Subanuns.

3. They also have as great a store of food as the Subanuns and are consequently as far removed from danger of starvation.

4. In weaving and pottery they are no farther advanced than the Subanuns, but in woodwork and metal work they have surpassed them. In metal work they have gained division of labor, in that various operations in the process of making articles of metal are carried on by different workmen.

5. The number of products used by the mountain peoples for ostentation are at least as numerous as those of the Subanuns, and many, such as the carved bowls and smoking pipes, are of local origin and design.

6. The Subanuns have but the beginnings of commerce, for their trade consists only of that with a higher race. The Igorots, Bontoks, and Ifugaos, on the contrary, have developed a system of exchange among themselves which is more important than the commerce carried on with outsiders. This exchange results from a diversity of production in the different communities.

7. Finally they have acquired a very definite idea of the value of their products. They are not cheated, as are the more simple Subanuns.

The life of the mountain peoples may be briefly described as one in which an excellent, though still primitive, system of agriculture provides an abundance of food and a surplus against the exigencies of a poor crop, and allows permanent residence and the utilization of the labor of a few men in the manufacture of useful articles and luxuries.

GENERAL COMPARISON[1]

Buecher, in his "Industrial Evolution," has aptly stated that human needs are capable of an infinite multiplication and subdivision; they are never at rest; they increase in degree and extent with the progress of civilization. Thus we have seen that the needs of the Negrito are little more than food, and of that barely enough to keep life in the body. After a people obtain a supply of food above actual immediate needs, their wants become more diversified; they begin to improve their methods of production, increase the variety of their diet, better their shelter and clothing, and develop taste for the artistic and for display. In short, their wealth increases not only in amount but in kind.[2]

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[1] In considering these three groups of peoples the subjects touched upon have been the products they use for food, clothing, shelter, and amusement, how these products are obtained and exchanged, and in what manner they are divided among the people; that is, the discussion has been about those things which minister to the physical needs of man and help him to live. Anything which helps man to live is called wealth.

[2] Certain forms of wealth which the Subanuns possess would not be considered wealth by the Negritos. For instance, the Chinese jars, which are with Subanuns the most prized of all possessions, would not be valued by the Negrito. In the same way the irrigation systems and the fertilizers employed by the Igorots would be useless to the Subanuns and consequently not be considered wealth by the latter. Likewise a plow or the services of a tailor would not be considered wealth by an Ifugao. Thus it can be seen that objects or services which may be classed as wealth by one group of individuals may not be considered wealth by another.

We must notice another peculiarity concerning those things which help man to live. "Some things are said to be valuable, as in the case of a gold watch or diamond ring, because in exchange for them we can get a great quantity of other articles. Ashes are of little or no value because we cannot get anything in exchange for them. Now this word 'value' is a very difficult one and is employed to mean different things. We may say that quinine is valuable for curing fevers, that iron is valuable for the blood, or that water is valuable for putting out fires. Here we do not mean valuable in exchange, for quinine would cure fevers just as well if it cost a penny an ounce instead of some ten shillings. Water, if we can get it at the right time, puts out a fire whether it costs much or little or nothing" ("Political Economy," by W. Stanley Jevons). It is clear then that by value we may mean *value in exchange* or *value in use* or both, and a thing which may have little value in exchange may have great value in use. Thus the value of air is the utility to the laborers and to the Islands, than the returns from producing the food itself.

In Chart II the relative increase of rice imports into the Philippines and the total exports from the Philippines since 1877 are shown.[1] It will be seen that until 1895, though rice imports fluctuated greatly, they increased in about the same proportion that the total exports increased. In 1899, however, rice imports increased in greater proportion than did the total exports, and have since kept this relative position, which is probably due to the scarcity of animals and the non-cultivation of rice fields. However, comparing the years 1899–1912 (by bringing them together at 1899 in Chart III) it will be seen that, in this period also, rice imports and the total exports tended to increase in the same proportion, the "bulge" during the first few years being caused by famine, pest, and drought. Hence, from customs statistics it is learned that the general increase in imports of rice is due to a proportional increase in exports, and that the extraordinary jump in rice importations in the period 1899–1912, over the period 1877–1895, results from the scarcity of animals for cultivating rice fields.

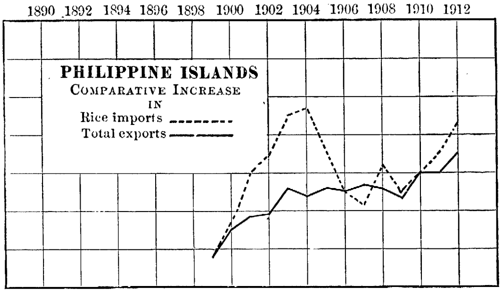

CHART III

4. Failure to obtain a full crop also results in importation. This may be due to several causes: (*a*) when there is no irrigation, crops often suffer from lack of water, with the result that a complete or partial failure of the rice crop occurs in many localities every year, and in exceptional seasons (as in 1911–1912) throughout the Philippines; (*b*) preparation

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[1] This chart is drawn on a logarithmic scale, which shows no definite amounts but (practically) percentages of increase and decrease.

The Negrito is in the *stage*[1] *of primitive group economy*, in which production is solely for the group's needs, and in which goods are consumed where they are produced. On the other hand, the Subanun is on the verge of, and the Bontok, Igorot, and Ifugao are just entering, the *stage of primitive town economy*, the stage of direct exchange, when goods pass directly from the producer to the consumer. The Subanuns are much more independent of nature than are the Negritos, since they have a surplus supply of food. The mountain peoples are still more independent on account of their irrigation system and their use of fertilizers. But their system of producing wealth, exchanging and distributing it, is, as a result, more complicated. There is greater division of labor between the sexes; artisans such as the blacksmiths and pipe-makers have emerged to spend their entire time in the making of one kind of article.

Thus we see an advance from a system in which each individual obtains his own food to one in which certain persons do not produce food but are dependent upon others for their sustenance. They transform raw materials into finished objects and exchange them for food, clothing, and other things that they need. We also see an advance from a stage in which men wander from place to place, to one in which they form towns. A more advanced stage is that in which each town produces certain articles. Such a division in the production of articles brings into existence the idea of exchange, first between individuals and then between localities (towns). This exchange in turn calls for men to take the goods from the producer to the consumer. From these men arises the need of a standard commodity which is always acceptable in exchange for products, and by which relative values of articles may be measured. This is money. Among the mountain peoples we have seen that bundles of rice are most often used as money. As civilization spreads we also note changes in the distribution of wealth. Among the most primitive peoples there is little difference in the amount of wealth possessed by individuals. This condition results from the simplicity of the method by which wealth is obtained and the small amount which exists. Among the mountain peoples, however, there are men who possess a large share of the surplus productive wealth of the community, such as rice terraces, pigs, and carabaos. Other men who have none of these must work for the owners, or must starve or revert to more primitive conditions of living. Hence these workers are economically dependent to a large degree upon the possessors of productive wealth.

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[1] The stages of economic development noted in this book are suggested by Buecher's chapter on The Rise of National Economy.

The Filipinos

Among the semicivilized peoples of the Philippines the mountain peoples have made the greatest economic advance. From them we may pass to the Filipinos.

The system by which their wealth is produced, exchanged, distributed, and consumed places the Filipinos within the stage of *national economy* — the stage of wholesale production and of the circulation of goods, at which products must ordinarily pass through many hands before they reach the consumer. This stage is not so easily comprehended as those of savage and semicivilized tribes. It is not grasped in an idea nor explained in a few words. Many economic laws, ideas, and customs not found among the primitive peoples govern the actions of men in this stage of civilization.

PART II. AGRICULTURE

CHAPTER II

FOOD CROPS — RICE[1]

IMPORTANCE AND FOOD VALUE

In nearly all parts of the Philippines the chief food consumed by the people is either rice and fish or corn and fish. As a general thing, the farther a place is removed from the sea the less fish is consumed there, so that in many inland localities the diet is almost entirely vegetable. In ordinary times of plenty the food of both the well to do and the poor varies little in either quantity or kind. In times of scarcity, however, the food of the poor usually decreases both in quality and in quantity, while the diet of the rich is not affected.

From the viewpoint of food values, corn is a better-balanced ration than rice. The latter is deficient in fat and contains less protein than any other cereal. Corn, on the other hand, is high in fat and has a considerable percentage of protein. The amount of protein contained in the three chief food cereals is as follows:[2] rice, 8 per cent; corn, 10 per cent; wheat, 12.2 per cent. Rice is an easily prepared and easily digested food when properly cooked, but its deficiency in nutritive values must be made up by other foods (such as fish, beans, and meat) which contain proteids and fats. The consumption of rice alone, toward which there is a tendency in the Philippines, results in malnutrition of the body. It would seem also that the cause of beriberi[1] is the lack of phosphorus in the diet of polished rice, a condition which can be overcome by the substitution of unpolished rice (which contains from three to five times as much phosphorus) or the more extensive use of fish and other foods containing phosphorus.

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[1] For description and commerce, see "Commercial Geography, the Materials of Commerce for the Philippines," by Miller, Bureau of Education, Manila, 1911; also *Bulletin 22*, Bureau of Agriculture, Manila, 1912.

[2] *Farmers' Bulletin 298*, United States Department of Agriculture.

CULTIVATION

Rice is both the chief food consumed in the Philippines as a whole and the principal crop of these Islands. An appreciable quantity of mountain or highland rice is grown, mostly in kaingin, in the less densely populated sections. This is sown broadcast, cultivated, and reaped as are other dry-land crops. The amount of rice raised by this system, however, is small in comparison with that produced by the lowland, or flooded-field, system, by which the greater part of the rice crop of the Philippines is grown. Along most eastern coasts and also on the northeastern coasts of some islands there is continuous rainfall throughout the year, so that there can be no definite seasons of rice culture. The inhabitants of one town may be planting while those of another, not more than a few kilometers away, are harvesting a crop. The central and western sections of the Philippines, however, are subject to a dry season, during which rice cannot be cultivated without extensive provision for water storage and irrigation. The amount of water so stored, or which can be diverted from rivers during the dry season, is almost negligible. Since the chief rice districts are in regions affected by the dry season, it holds generally for the Philippines that but one crop of rice is raised. This is planted and cultivated during the rainy season (from June through November) and harvested at the beginning of the dry season (December or January).

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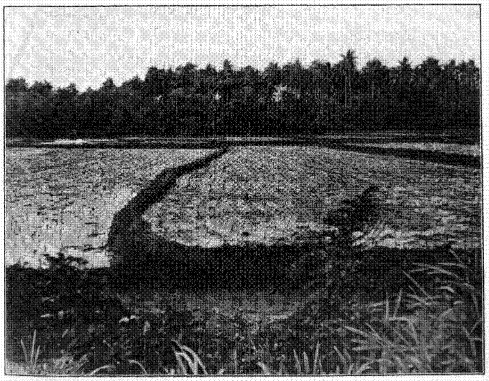
[1] A prevalent oriental disease characterized by an anæmic condition of the body.

The rice lands in the Philippines are divided into small fields in which dikes serve to keep the water. When the soil has become softened it is plowed and harrowed. The plow used is a small one-handled affair of wood, sometimes shod with iron, which merely digs and does not leave much of a furrow. The harrow is usually made of bamboo, with iron or wooden pegs pounded through and fastened. In many places it is customary to further reduce the soil to a slush by driving carabaos on it or working it up with the feet. The seed is sown thickly in beds, which are usually near the house of the farmer. When the young plants are a foot or more high, they are pulled and transplanted to the fields by the women. If the rains are sufficient to drown the weeds, the farmers may rest until harvest time; but if a dry period occurs so that the water does not stand in the field, it is necessary to cut out the weeds.



NEWLY PLANTED LOWLAND RICE FIELDS

HARVEST, SALE, AND CONSUMPTION

One of the most expensive parts of rice production is the harvesting, which is done by hand. The heads are cut, leaving short stalks which are tied together in bundles the size of the fist. In the sections of the Philippines where there are many small holdings, the farmers are wont to make communal labor of planting and harvesting. In many districts where land is in large holdings, it is customary to harvest on shares for an amount varying from one tenth to one third of the crop, the usual amount being one fifth. During the latter part of a very bountiful harvest season even half the crop may be given to reapers as an inducement to keep them at work. In certain places there is a tendency to substitute daily wages for this system, particularly when a poor harvest occurs and the price of rice is high. In other places the two systems are combined, as, for instance, in Nueva Ecija, where wages varying from ₱0.15 to ₱0.20 are paid, with the privilege of carrying away as much rice as can be put in a basket. Thus a family of three may work six days and get ₱2.70 in cash, and four or five cavans of rice valued at ₱10 or more. As a substitute, daily wages of only ₱0.40 are paid.[1] This system of harvesting on share is decried by all who have made a study of the situation from the commercial viewpoint. In the first place, it results in exorbitant cost of the production of rice. In the second place, a family working a month can obtain enough rice to support them for six months, during which they need do no labor. This is conducive to laziness and vice. In well-populated sections of the Philippines during the harvest season there is an exodus to rice regions, sometimes a considerable distance away. Often whole families leave their homes. On returning they usually bring with them their share of the crop.

At a glance it would seem that this state of affairs might be changed by machinery, but thus far the mechanical harvester has not been successful in the Philippines. In all

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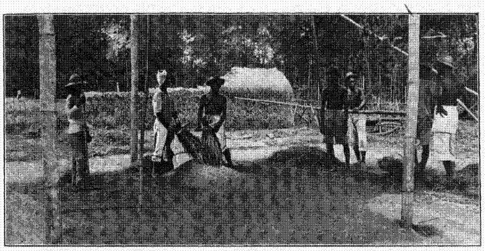
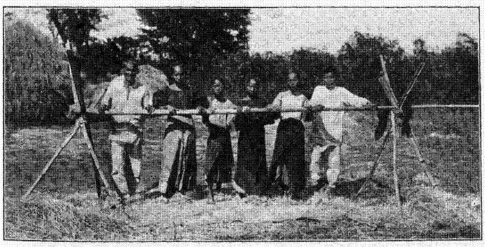
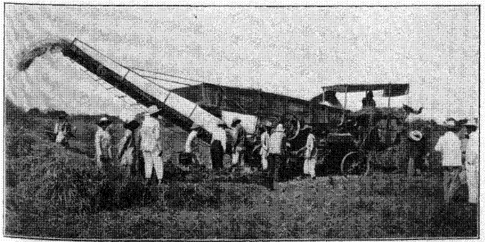
[1] From the economic report of Cenon S. Monasterial.



Pounding the Heads on a Log

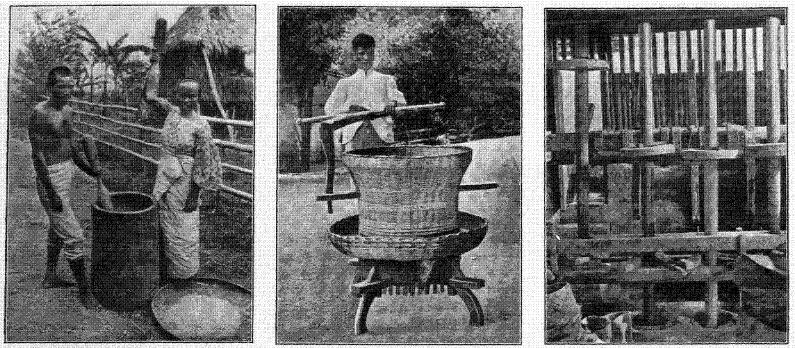


Treading out the Grain



A Steam Thresher

METHODS OF THRESHING RICE

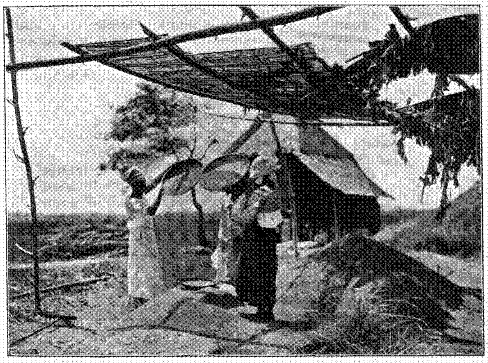


DIRECT HUMAN POWER

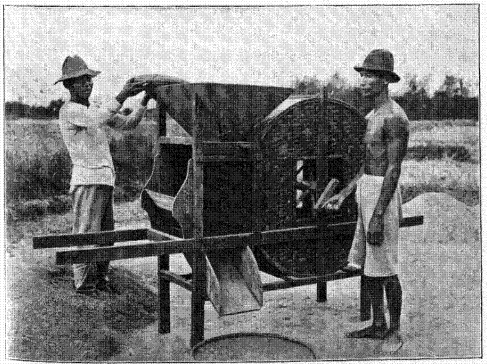
INDIRECT HUMAN POWER

WATER POWER

METHODS OF CLEANING RICE



Winnowing with the Wind



A Winnowing Machine

WINNOWING RICE

localities the crop is cut by hand, and in nearly all districts rice is threshed by pounding or tramping it, although in the large rice-growing regions steam threshers are coming into use.[1] These charge one tenth of the amount threshed.

The removal of the hull and bran is the final step in the preparation of rice for cooking. If rice is to be used locally, this is nearly always done by hand in a wooden mortar and with a wooden pestle, or in a crude rice mill made of mud and bamboo. In exporting regions, such as the Central Plain of Luzon, rice mills have been introduced in large numbers, the product being sent away in the form of polished rice. Except in large cities it is customary among Filipinos to store rice in the husk, as it is supposed to keep better in this way. It is hulled as needed. Where mills exist, however, householders often take their rice to the factory one sack at a time, and have this amount cleaned. The charges for milling rice are usually 10 per cent of the amount milled, or ₱0.25 per cavan.[2] Hence the mill owner receives the greater profit by milling on the share.

In certain districts of the Islands, from northern Luzon to Mindanao, a peculiar phenomenon is connected with the sale of rice by owners of small amounts of land. Immediately after the harvest the price of rice is low, but with almost inconceivable shortsightedness the small farmers sell practically their whole crop to the merchants who control the trade. Soon the small amount of rice that they have retained is exhausted, and they begin to buy back at a constantly advancing price what they have sold, so that just before the next harvest they have to pay anywhere from 100 to 200 per cent profit to the merchants. These small farmers often squander the money received from the sale of their crop as soon as they have obtained it, with the result that considerable misery is caused. Sometimes they are so improvident, or so hard pressed, that they sell their crop in advance, at about half its nominal value.

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[1] There are now about a hundred threshers in the Islands.

[2] From data at the Bureau of Agriculture.

RICE IMPORTS

The amount of rice raised in the Philippines is far from sufficient to supply local consumption. It was estimated by the Bureau of Agriculture that the local production in 1910 was about 530,000 metric tons of cleaned rice. In the same year 185,000 metric tons of rice were imported.[1] In the middle of the nineteenth century the Philippines were already importing a little rice. About 23,000 metric tons were imported in the year 1877, being 5.78 per cent of the total value of imports. Since then there has been a fluctuating but increasing import. About 250,000 metric tons of rice, valued at over ₱10,000,000, and representing about 20 per cent of the total imports, were brought into the Philippines in the year 1912.

The history of rice importations into the Philippines and of the price of rice is graphically shown in Chart I.[2] In Fig. I the light angular line shows the actual imports by years. The heavy line is a smoothed one and shows the tendency of the rice trade over a period of years.[3]

The lines of Fig. II represent actual prices and the tendency of prices respectively. From the smoothed line (heavy) it will be noted that the price of rice gradually fell in the period 1877–1895, that it jumped considerably in 1899, and has remained practically stationary since that time. The high price in 1912 is the result of general rice shortage.

From the smoothed line in Fig. I it is seen that imports of rice increased, though not continuously, in amount from 1877, the increase being particularly large in the period after American occupation. Turning now to the fine line showing actual imports, we see that rice imports have fluctuated greatly, and that there are five periods of extraordinary rice importation between the years 1877 and 1912. Either of two conditions may have caused these extraordinary importations — the

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[1] The year 1910 may be taken as a usual one. Allowing an average con- mption of 1½ chupas of rice per day for 6,500,000 inhabitants (that is, the pulation of the Philippines less the population of corn regions), a total arly consumption of 715,000 metric tons is obtained, which supports the uracy of the above figures.

[2] No reliable customs statistics are available for the years 1896–1898 lusive.

[3] The position of the smoothed line is obtained by averaging the figures rice imports by sevens. The averages so obtained are noted by crosses.

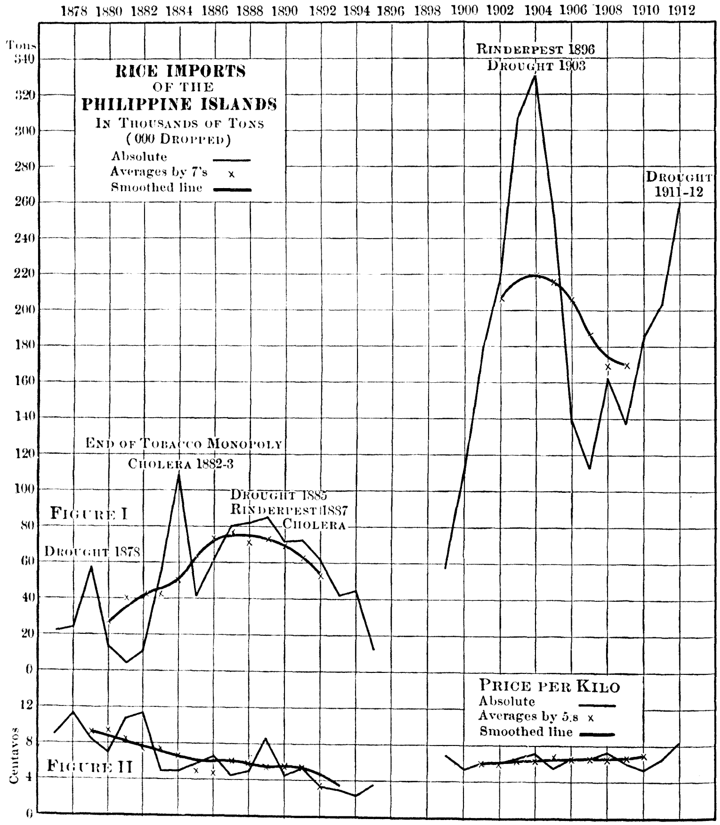

CHART I. PHILIPPINE RICE IMPORTS

Census and Customs Statistics

price of rice in Saigon, or shortage in the local crop. Comparing the line of actual imports with that of actual price, it will be seen that they bear no constant relation. Imports of rice do not tend to increase as price decreases, nor vice versa.

It is probable that the world price of rice is not much affected by the imports of the Philippines; neither do the Philippines import larger quantities of rice when the price in Saigon is low.

Extraordinary importations of rice would therefore seem to be the result of decrease in the local crop, and history bears out such a conclusion. The unusual importation of 1879 was the result of the drought of the season of 1878–1879. The large import of the year 1883–1884 was caused by the end of the tobacco monopoly in 1881 (and the consequent increased planting of tobacco at the expense of rice cultivation) and by the cholera of 1882–1883. The large increase in rice imports in the years 1886–1889 was due to the drought of 1885, to the "epizootia" (similar to or identical with rinderpest), which began in 1887, and to cholera in 1888–1889. The increased imports of 1901–1905 were occasioned by the rinderpest and the drought of 1903. The drought of 1911–1912 brought about the last extraordinary increased rice import. The local crop of rice and corn in 1912–1913 was a very large one in consequence of increased planting and favorable weather conditions. Hence the imports of rice will probably again fall below the average.[1]

Extraordinary rice importations are the result of temporary conditions. The heavy line in Fig. I shows the general increase in rice importation from 1877 to 1912, an increase which has been comparatively steady and which is apparently even now continuing. The causes which have brought about this general increase are permanent and may be discussed under four headings.

1. First should be mentioned the lack of work animals. In Japan and sections of Java a carabao in a rice field is an unusual sight, all steps in the preparation of the soil being carried on by hand labor. In the Philippines, however, it is considered essential to plow with a carabao, and hence, because of the scarcity of animals due to rinderpest, much of the rice land in the Philippines has been allowed to remain idle.

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[1] Consult reports of the Insular Collector subsequent to 1912.

2. Actual failure to cultivate rice lands often occurs even where animals are obtainable. The method of rice culture in the Philippines is such that it involves greater effort, disagreeableness, and monotony than most other work, and the status given the field laborer is the lowest. As a result there is a tendency to take up more agreeable work or to labor as little as possible in the rice fields. This condition has left many small holdings uncultivated, and many large owners without labor. The failure to cultivate rice lands can also often be laid at the door of the large owner, who has preferred to live in cities rather than superintend his farm.

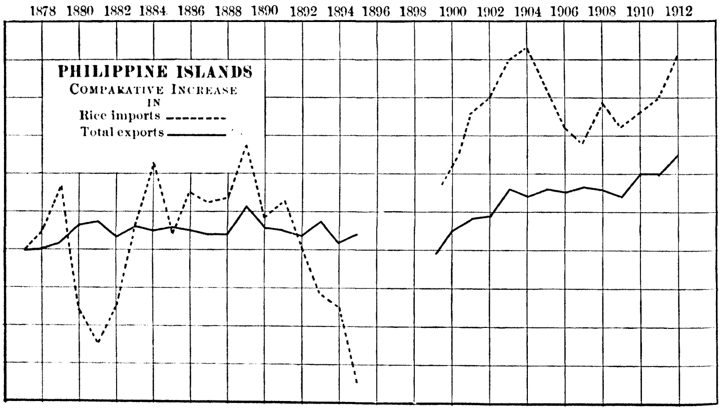

CHART II

3. Another very important reason for lessened rice cultivation in the Philippines is the production of export crops such as copra, abaca, tobacco, and sugar. These crops require less labor, and that of a more agreeable character. The high price received for abaca, tobacco, copra, and sugar, and the fact that less labor is required or is more easily obtained, have encouraged landowners to devote their holdings to them rather than to the production of food. And indeed it would seem that in many cases the net returns from raising export crops and importing food are greater, not only to the landlord but

that out of 910 well-known varieties but 25 are capable of a yield and quality commercially profitable. While there is often selection in the variety of rice raised, in but few instances is there any selection of the seed planted. Even though a certain amount of seed be put aside for the next planting, there is no attempt to pick out the best heads. Farmers usually take what palay is left fro[illegible] that stored in their homes, or they buy seed of any character. By cultivating the best varieties and carefully selecting the seeds from these, the yield of rice in the Philippines could be increased several fold.

c. Perhaps the most important factor in increasing the yield of rice is efficient irrigation. Leaving out of consideration the additional crops that could be raised by irrigation, and that would at least double the total yield from the land under cultivation, the benefit of a constant supply of water warrants careful consideration. The prime need of rice during its growth is water. Conditions in the Philippines are such that at the present time barnyard or artificial manures cannot be profitably applied to rice lands, but a constant supply of water assures a good crop on almost any type of soil which has an underlying impervious layer of clay.[1] As a rule rice lands are dependent upon the rains, and much rice is lost here and there throughout the Archipelago in all years, and during seasons of widespread drought, such as occurred during 1911–1912, there is a general failure of the crop. These losses could be stopped by storage and irrigation. The methods by which the water may be obtained and distributed on the land will be taken up under a more general heading, but the question of the organization by which irrigation systems for rice lands may be built can receive attention here. In certain regions local capitalists have built small irrigation systems. In a few districts such systems have been constructed by coöperation; that is, the fields which receive water belong to those persons who have together built the system. Here and there throughout the Philippines are found and cultivation of the soil are usually poorly done, this resulting for the most part from lack of suitable agricultural implements; (*c*) pests, such as worms and field rats, do no small amount of damage to the rice crop, and in exceptional years locusts destroy much of the growing and standing crop.

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[1] *Bulletin 22*, Bureau of Agriculture, Manila.

INCREASE IN DOMESTIC PRODUCTION

The only consideration which would warrant the importing of rice by the Philippines is that under the third heading — the raising of crops the products of which can be exported and exchanged for more rice than could be grown locally. But such a procedure, when carried to the extreme, results in a dangerous situation, since it makes the Philippines dependent upon foreign supplies for food. It is an axiom of good government that a country should produce as much of its own food supply as possible. This subject cannot be treated here at length, since it properly comes under a more general heading (see Chapter XI), but it will be readily seen that if the crop in southeastern Asia (the rice-exporting region of the world) be seriously curtailed by unfavorable climatic conditions, political upheaval, or the like, the consequences would be extremely disastrous to the Philippines. Such a condition was approached in the season 1911–1912, when there was a partial failure of the rice crop. A consideration of the methods by which production of rice in the Philippines could be increased is therefore extremely important.

1. An increase in the number of work animals — carabaos and cattle — will bring into cultivation much of the rice land now lying idle. In several districts of the Philippines there have been large importations of draft animals from Asia, and a correspondingly increased area devoted to rice production. On account of rinderpest and other diseases existing in Asia this importation is extremely dangerous, however. Several outbreaks of rinderpest and other diseases have been directly traced to infection introduced in this manner. Hence the

importation of foreign cattle and carabaos has been carefully guarded, and the government has undertaken a campaign of quarantine and close supervision of the draft animals in the Philippines, with the hope that by this means rinderpest will be eradicated from the Islands, or, at least, held in control, and that no further infection from the outside will be allowed to complicate the situation. This policy has for its purpose increase of animals by natural reproduction and the preservation of those now alive, and will necessarily be rather slow in bringing about the desired results. If successful, however, this policy will solve, as no other will, the problem of increasing farm animals in the Philippines. In the immediate future there will be an increase in the number of animals available for farm purposes in certain regions. Such regions are southern Luzon and others in which railroads and good roads are being built. Here animals, which were previously used to transport exports from the interior to the shipping points, will become available for work in the fields.

2. A further increase in the yield of rice would be possible if the cost of production could be reduced so as to give greater profit.

a. The largest reduction can probably be made in harvesting. The share system, by which the harvesters receive as much as half the crop, and the resultant ill effect upon the workers, has been explained. By substituting for this system a wage system these evil effects would be done away with and greater profit would accrue to the grower. It is probable that further reduction in the cost of harvesting could be made by improved implements. It is possible that better hand implements than the short knives now employed can be devised. In the United States the cradle is used to advantage. This cuts quickly and leaves the grain in a condition which facilitates handling and quick and even curing, but considerable strength is required to operate it.[1] Harvesters intended for the temperate regions have not been successful in the Philippines.

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[1] The *Louisiana Planter* (August 6, 1910), p. 87.

For instance, some imported from America were found useless because they were geared to work at the rate of 2¼ miles per hour (which is the rate at which horses can pull the machine) and would not operate when going at a rate of 1¼ miles an hour (which is the speed of a carabao). Combined harvesters would also be unsatisfactory on account of the smallness of the field and the tendency of heavy machines to become stuck in the mud. If machinery is to be used in rice harvesting in the Philippines, the kind must be determined by actual experience in the local needs.

Photo by Bureau of Agriculture

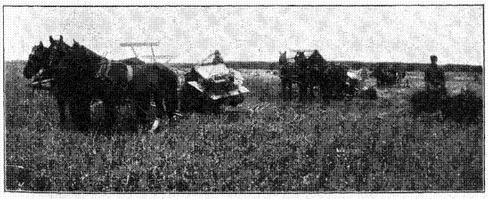
HARVESTING RICE BY HAND IN THE PHILIPPINES

b. If small producers would discontinue their practice of selling nearly all their rice at the harvest, only to buy it back later at high profit to the merchants, much loss would be avoided.

3. Even with the present number of animals and the present area of cultivated land, the amount of rice produced in the Philippines can be greatly increased by better methods of cultivation.

a. For the inefficient plow and harrow now used there can be substituted plows, harrows, and other implements which are much more effective in digging into the soil, turning it over, and pulverizing it. It must not be thought, however, that the agricultural machinery used in other countries can be

Cradling a Field of Wheat
Courtesy of Keller and Bishop



Harvesters in Manitoba, Canada
From Brigham's "Commercial Geography"

Wheat bundled by Harvesting Machines and piled in Shocks
From Brigham's "Commercial Geography"

METHODS OF HARVESTING

successfully employed in the Philippines. Agricultural machinery is an outgrowth of needs and experience. Nearly all of it originated in America, where the problem has been to cultivate large fields with little labor, and where horses are used. The problem in the Philippines is to obtain machinery suitable for land soaked with water, which can be drawn by carabaos or cattle, and which will be effective in small fields where the furrows are short and the animals have to be turned many times.[1] Plows adapted to American fields have failed in the Philippines because they do not meet these conditions. Drills for planting the seed have not been successful because they are not intended to work in soil so poorly plowed as are Philippine fields. On the other hand, plows which have been especially designed for Philippine use have been successful in a number of districts. The matter of agricultural implements can therefore best be met in the Philippines either by adapting implements and machinery used in other countries to the local requirements, or by devising entirely new ones. This opportunity is a large one.

b. Another important consideration is that of seed selection. There are many hundred varieties of rice found in the Philippines, most of which are lowland rice. Some of these yield twice as much as others. In most communities farmers have come to recognize the kinds which give best results in their particular soil, but in many localities there is still but little attention given to the selection of the variety of rice planted. It has been estimated by the Bureau of Agriculture thus increasing its digestibility, and in eliminating the germ, thus preventing the meal from becoming rancid. In the United States, especially, these improvements have been undertaken in an organized manner, and corn propaganda has spread even to Europe in the attempt to educate people in the proper preparation of corn for food.

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[1] The difficulty of the short furrow results from building the dikes with straight sides. This may possibly be overcome by making rounded dikes over which the machine can be dragged. Plows, harrows, and drills can be pulled by carabaos or cattle; binders and such machinery, which only work satisfactorily at a good rate of speed, may be propelled by gasoline. All heavy machinery, however, can only be used on firm ground.

Most rice soils in the Philippines are such that during the planting or harvest season, or during both seasons, they are too soft to sustain machinery. The improved plow is thus far the only agricultural implement which has been successfully adapted to small farming in the Philippines. The single-handle steel-beam breaking plow is a success.

Corn surpasses all other crops in increased return received for labor expended. In the United States such a large area is yearly devoted to corn growing that even a slightly increased yield per hectare gives an aggregate increase of considerable value. The farmers of the "corn belt" are obtaining increased yields by improved methods of tillage and seed selection. These new methods and ideas are studied out in colleges and experiment stations, and are brought to the farmers in many different ways. Among the most effective methods of propaganda is the scheme of special railroad trains, fitted up as lecture halls and provided with corn experts, who are thus sent throughout the corn-growing area to advise the farmers. Much of the expense of these trips is borne by the railroads, who consider it a good investment, since the returns from the increased amount of freight given them by the larger crop more than recompense them for the outlay. Bulletins, the introduction of the study of corn growing in the public schools, farmers' corn-growing coöperative clubs, and special corn demonstrators have also been effective.

Though the total amount of corn produced in the United States shows a steady increase, the demand keeps pace with the supply. Since 1901 the world's production of corn has increased much faster than that of other cereals.

Importance in the Philippines

Corn was introduced into the Philippines from Mexico. Its social status in the Islands is low, for it is generally known as "poor man's rice." At present the value of the corn crop is probably one eighth that of rice, but the increased interest quite extensive irrigation works, the efficiency of which has been in many cases reduced or destroyed through neglect or damage. Such irrigation systems were built years ago by the owners of large estates, particularly on the Friar lands. But neither capitalistic, communal, nor private enterprise is able to build the irrigation works which certain regions warrant and topography necessitates. S[illegible]h projects must be undertaken by the government, since they need careful study for a long period of years and the expenditure of a large sum of money to build and maintain. It is estimated that there are in the Philippines 1,044,000 hectares of rice land under cultivation. Of these about 50,000 hectares are irrigated from permanent systems. Preliminary surveys have proved the existence of 485,000 hectares of land in the Philippines capable of irrigation.[1]

The average annual production of rice throughout the Philippines is probably less than 15 cavans per hectare. The average production of rice in exceptionally favorable years, when sufficient rain falls at the required time, is from 25 to 40 cavans per hectare. Under the present system of tillage, planting, and seed selection this difference may be said to result from irrigation.[2] Irrigated lands properly cultivated and planted with selected seed produce from 50 to 75 cavans per hectare. It may be stated, therefore, that the cultivated rice lands in the Philippines should, with irrigation, better cultivation, and seed selection, yield from three to four times the quantity of rice now produced on them. With increase in animals and lower cost of production, many of the rice fields which at present are lying idle would be brought into cultivation. With better means of production, as much as four times the present yield could be obtained. Hence it is possible for the existing fields to yield more than a sufficient quantity of rice for the needs of the Islands.

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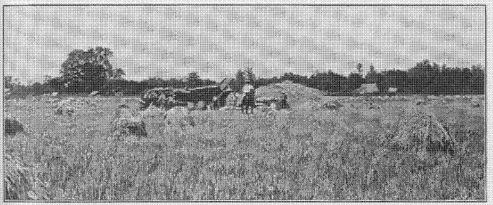
[1] *Philippine Agricultural Review*, Vol. II, No. 11.

[2] These estimates are given after a careful review of all data available, including some eight hundred estimates from as many municipalities.

4. The changes upon which this increased production depends can only be brought about slowly, however, and for the immediate future another method of meeting the situation presents itself. This is to bring large tracts of virgin land into extensive cultivation. Such undertakings must be carried on by the government or by large corporations having sufficient supply of money. Throughout the Orient rice is raised in small diked fields, just as in the Philippines, except that in many localities hoes, spades, and mattocks are used instead of the plow, and that in most countries careful cultivation of the soil and selection of seed are carried on, making the yield per hectare much larger. In the United States, however, an entirely different method is followed. Rice was introduced in the American colonies in 1790 by accident. It is now raised along the southeastern seacoast in fields of moderate size. Modern machinery is used for preparing the soil, and drills are used for planting. The crop is cut with sickles, but threshed and cleaned by machines.



RICE HARVEST IN LOUISIANA

From Brigham's "Commercial Geography"

In 1884 farmers began to settle the great southern prairie of Louisiana and Texas along the Gulf of Mexico. They found that rice grew well, and they commenced immediately to adapt large agricultural machinery such as is used in wheat growing. Difficulties were met and overcome, and, on the whole, the extensive cultural operations employed have been most successful, and larger areas are being devoted to rice every year. By these methods very large fields and more or less extensive irrigation systems are used, the water being pumped from rivers or wells. Heavy modern machinery is used in preparing the soil and in planting. From the time the rice is a few inches high until the harvest, the field is kept under water. Just before the rice is mature the water is drawn off, so that by the time the crop is ready for harvest the ground is hard enough to bear the self-binders which automatically cut and bundle the grain. Large threshers and mills prepare the rice for market. The product thus obtained is of high quality and sells for from ₱4.10 to ₱4.55 per cavan.[1] The northern part of the Cagayan Valley is a large plain, the soil of which is well suited for rice. In the northeastern part of the Central Plain of Luzon there are large tracts of virgin rice land. In such regions as the Gandara valley of Samar, and the Agusan and Cotabato valleys of Mindanao, there are thousands of hectares of new rice land. With modern methods it would seem that all these were capable of producing vast quantities of rice at low cost. The question of available labor and of weather and soil conditions must be carefully considered, however. The problem of bringing laborers into these regions, founding settlements, and importing food and other necessities is a difficult one. In the "bonanza" rice region of the United States planting is done at the beginning of the rainy season, and the harvest takes place during the dry season. After that, frost and snow prevent growth of weeds until the fields are again ready for planting. In the Philippines, rice fields, whether or not they are cultivated during the dry season by irrigation, must be cultivated during the rainy season or else they will grow up with heavy undergrowth, expensive to clear. But rice matures in less time than the rainy season continues; hence it would be necessary to plant early on dry soil with large machinery and reap by hand on soggy land, or plant by hand within the rainy season and reap by heavy machinery during the dry season. Hence it is not probable that large cultivation with machinery will succeed in the Philippines except on the limited soils which quickly become compact after a hard rain.

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[1] *The World To-day* (January, 1910), p. 99; *Farmers' Bulletin 417*, United States Department of Agriculture. The prices noted are less than current prices for rice in the Philippines.

A more immediate solution of the problem is that of rice colonies. The government may colonize virgin rice regions with people from densely populated districts and provide them with homes, animals, and implements necessary in intensive rice culture.

CHAPTER III

FOOD CROPS — CORN[1]

Importance in the World

As compared with wheat and rice, the status of corn in the world's market is rather peculiar. Although the world's corn crop is larger than that of wheat or rice, the comparative amount of corn directly consumed as a human food is small. Probably the chief reason for relegating it to the position of an animal food is the coarse and rough texture of corn meal when the ground fibrous hull is present. The people of wheat-eating countries are prejudiced against corn because of its color and the unfitness of its meal for porous bread. The protein of corn, unlike the gluten of wheat, is not elastic, and the bread is granular rather than porous. Moreover, corn bread is not so attractive and does not keep in good condition as long as does wheat bread. In the Orient it is compared unfavorably with rice, since it has to be cooked nearly twice as long, and in tropical countries generally it has found less favor on account of the ease with which weevils destroy the stored grain.

Corn has therefore become the chief food in but few regions of the earth, though in many countries it is an important supplementary food. The world's crop has been used mostly to fatten hogs and cattle, and in several important manufacturing industries. In recent years, however, the value of corn for direct human consumption has been more thoroughly understood, and methods of preparation have been developed by which this grain can be made more easily digestible and more appetizing. The chief advances made in the commercial preparation of corn have been in separating the hull from the meal, now manifested in corn will result in greater production. The people are beginning to understand its value as an article of human diet and as fodder for horses and carabaos, and they are coming to realize that a large return may be expected from the amount of seed planted even when grown under poor conditions.

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[1] *Bulletin 23*, Bureau of Agriculture, 1912, Manila.

In certain districts of the Philippines corn is the chief food of the people throughout the year. Probably one fifth of the total population of the Islands lives in these districts. Unlike rice, corn demands a fairly porous soil which will not hold water. Hence the coralline limestone soils found on Cebu, on Siquijor and in Oriental Negros, and in parts of Occidental Negros and Bohol, are planted to corn, and this cereal is the staff of life in these localities. It is also the chief food crop in the upper part of the Cagayan Valley, which is the great tobacco region. Corn is planted there as a second crop after the tobacco has been harvested. In certain districts now producing export crops, for instance parts of Misamis, corn was formerly the chief crop and food. A scarcity of animals is given as the principal reason for the diminished cultivation.

Fish, meat, and beans supplement corn, though fish is probably used to a less extent in these sections than in rice-eating districts.

Corn may be crushed and ground into coarse meal in primitive stone mills run by hand, in which two or three days' supply can be prepared at one time. By sifting and blowing, much of the husk is removed; the remaining meal is put into a pot of boiling water and cooked about fifteen minutes (half the time required for complete cooking). In the Cagayan Valley the kernels are soaked for about a minute and then pounded in a mortar with a pestle — a long task. By shaking and sifting, the large pieces of the inner portion of the kernels are separated. The finished product is known as corn rice and is usually cooked about half an hour.

It is interesting to note that in the corn-eating sections of the Philippines the wealthier persons usually live on rice, and

In regions where corn is not the chief food the form in which it is regularly eaten differs somewhat according to its importance in the diet of the people. In those districts where corn constitutes the largest part of the diet during half the year, it is eaten in the forms previously explained. Where it is of considerable importance throughout the year, it is often ground to a meal and mixed with rice, "in order to make the rice go farther." It is consumed to lend variety to the regular diet, or is eaten between meals boiled or roasted on the cob. In a few sections the preparation of corn by removing the hull is understood. Parched corn is eaten throughout the Philippines and is often carried by travelers.

In those localities where little corn is used, only one crop is grown, but in most districts two crops, and, in many regions where corn is the chief food, three crops are produced in a year.

The cultivation of corn in the Philippines is as crude as the methods followed in the production of rice. Preparation of the soil is inefficient, seed selection is lacking, too many stalks are grown in a given space, and fertilizers are employed sparingly if at all. Corn is also lost by the attacks of pests in the field. On an average about 8 cavans of corn per hectare are produced here. In the United States the average yield per hectare is 30 cavans.

At the present time corn is stored in three ways in the Philippines: (1) the whole ear, including the husk, is fastened to a framework or on the side of the house, end down and fully exposed to the sun; (2) the ears are tied together, thoroughly cured in the sun, and stored under the roof of the house, where smoke assists in protecting them from weevils; (3) where corn is not to be kept very long it is shelled, thoroughly dried in the sun, and stored in large baskets. However, shelled corn is liable to attack by weevils.

The difficulty with which corn is stored makes it a crop which must be consumed soon after harvest. This to no slight degree discourages its planting.

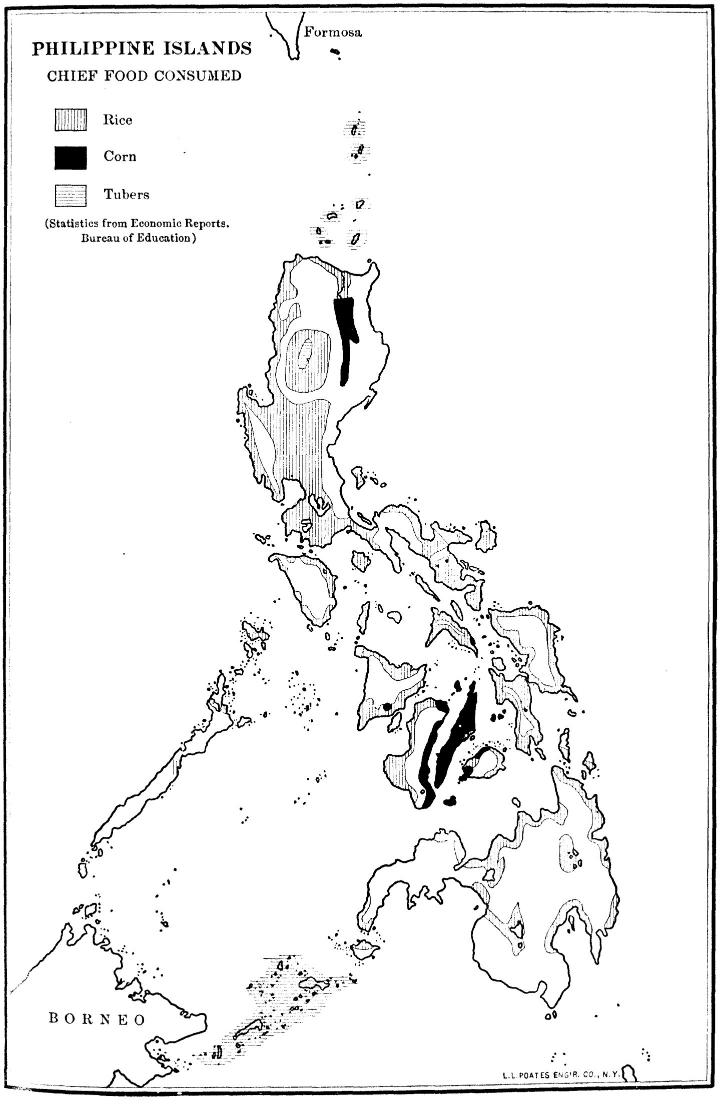
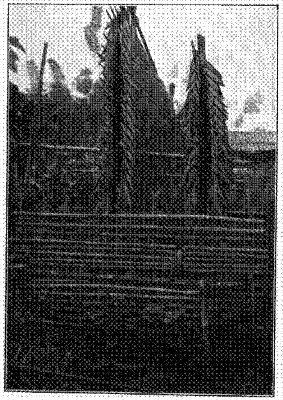

PHILIPPINE ISLANDS
CHIEF FOOD CONSUMED
Rice
Corn
Tubers
(Statistics from Economic Reports. Bureau of Education)
Formosa
BORNEO
L.L. POATES ENG'R. CO., N.Y.

CHART IV

that rice is often served by the poor on special occasions, as fiestas and the like. Nevertheless, in certain regions in which corn was formerly the chief food, but in which rice has now displaced it on account of its availability in exchange for export crops, many of the inhabitants still prefer corn and will put themselves to much inconvenience to procure it.



CORN STORED ON FRAMEWORK

The importance of corn as a food supplementary to rice varies considerably in different parts of the Islands. In some regions, such as parts of northern Mindanao, Leyte, Bohol, Masbate, Batangas, Bulacan, and Abra, corn almost equals rice in the amount consumed. In other sections it occupies a minor place in the diet of the people, and in some localities it is scarcely eaten at all. As a supplementary food corn is much grown on hill lands in kaingin, either by itself or as a catch crop. It is also sometimes planted as a catch crop with sugar cane, and as a second crop after sugar cane or rice. In many regions corn is planted in small patches here and there among main crops. Since corn requires less moisture than lowland rice and yields food from three to four months after planting, it often becomes an important crop after or during rice failure. As a result of the drought of 1911–1912 corn became an important crop in many sections of the Philippines, as, for instance, in the Central Plain of Luzon and in Laguna Province.

Increase in Production and Use

There now seems to be a tendency to increase the production of corn, and this is being encouraged by the government.[1] Reasons for promoting the growth of corn in the Philippines are found in the following conditions: (1) corn is an excellent human food when rightly prepared. It becomes an important food crop where rice cannot be grown, and as a supplementary food it proves of great importance in connection with rice and during failures in the rice crop. (2) On account of the possibility of three crops a year and the large yield per hectare, corn is a good crop to raise for sale. (3) The leaves of corn make excellent fodder, the gathering of which in no way diminishes the yield of grain. This is an important consideration, for at the present time the Philippines are deficient in food for stock.

As has been previously stated, no other crop responds so readily to intelligent labor as does corn. A few points may be briefly noted.

1. The better cultivation of the soil and the improvement of implements necessary in producing rice (see p. 40) are also essential factors in the cultivation of corn.

2. The question of seed selection is particularly important with corn, for many of the local corn-crop problems may be solved by foresight in this matter. These problems are (*a*) to secure an increase in the amount of corn grown, which will result from the production of two ears on a plant and a greater number of seeds to the ear; (*b*) to have the ear grow on the lower part of the stalk so as to reduce the liability of its being destroyed by winds; (*c*) to produce an ear completely covered by the husk, which thus prevents the entrance of weevils and of rain, both of which are destructive; (*d*) to produce an ear hanging downward so as to prevent entrance of rain.

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[1] The Bureau of Agriculture met with particular success along the railroad in Panay. During September, 1911, the railroad handled 18,000 kilos of corn from Iloilo Province, and in September, 1912, 400,000 kilos, a gain of over twenty-two fold.

CHAPTER IV

LESSER FOOD CROPS

Supplementary Foods

While rice or corn is the chief food in nearly all parts of the Philippines, certain other crops supplement these two.

The sweet potato is used in every district as an important supplementary food to rice and is the chief food in certain inland mountainous regions throughout the Islands. The cultivation of this crop by the Igorots, because of the lack of suitable rice lands in their country, has already been noted (see Chapter I). This same reason for its cultivation holds also among the Filipinos. In the Batan Islands sweet potatoes and other roots and tubers constitute the chief crops, not only because ground suitable for rice is not obtainable, but also because of the high winds which accompany the frequent typhoons in this region and destroy or badly damage all vegetation above the ground.

The social position of the sweet potato in the Philippines is much lower than that of corn. "They live on camotes" is, in most sections, a sufficient and vivid description of a state of abject poverty.

The nutritive value of the sweet potato lies almost entirely in the starch it contains, protein and fat being negligible. The sugar content of the Philippine camote is small. Beans, fish, or other foods high in protein should be eaten with camote.

In many regions, particularly where it is the chief food, the camote is planted in separate fields. It is also often grown as a second crop after rice, or as a catch crop between other

3. Fertilizing is also very important. Barnyard manure, green vegetable matter growing in the fields and carefully turned under, and commercial fertilizers all result in large increase of yield.

4. Corn in the Philippines has always been planted too thickly. By maintaining proper distance between rows, and between plants in the row, a large increase in the yield can be expected. The system of growing legumes, such as cowpeas, greengram (mongos), peanuts, and the like, between the rows of corn would also tend to produce a larger crop and to increase the fertility of the soil. At the present time practically no rotation of crops for preserving or increasing the fertility of the soil is practiced in the Philippines. If corn were rotated with tobacco, cowpeas, peanuts, upland rice, and millet in proper sequence, the exhaustion of the soil would, to a large extent, be prevented.

A PLOT OF CORN

It has been shown that[1] corn planted without effort to obtain the best results yielded from a given area $10\frac{1}{4}$ pounds of seed; that the same area, when planted regularly in rows a half meter apart and frequently cleaned and hoed, gave about six times as much as the first crop; and that the same area, when planted one meter apart and given the same cultivation, produced more than nine times as much.

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[1] *Agricultural Review*, Vol. III, No. 8.

Improvements in the method of its preparation will also result in a greater appreciation of corn as food. As a substitute for the crude stone mill, there have of late been imported into the Philippines small steel mills. The cheapness of these renders it possible to place them in every small community if not in every household. If corn is to be elevated from its lowly position as "poor man's rice," the people must understand more thoroughly the methods by which palatable foods may be prepared from it, and the necessity of longer cooking. This matter is now receiving attention and publicity, and, with the tendency toward increased production of corn already noted, should ultimately result in an increased use of corn as a food supplementary to rice and as a chief food in connection with fish, beans, and other products high in protein.

The chief problem which confronts the small producer of corn in the Philippines is to obtain better and cheaper methods to preserve the grain over a longer period of time than is now practicable. Treatment with carbon disulphide (practiced so much in the United States) is impracticable here on account of the inflammable nature of the gas. It would seem that unless some herb or other simple insecticide is found, the evolution of an ear in which the husk thoroughly covers and protects the grain is the only practical solution of the difficulty. For commercial purposes large amounts of shelled corn may be protected by means of carbon disulphide.

different "famine" conditions should be noted: (*a*) annual seasons of restricted diet resulting from too small production of food; and (*b*) extraordinary times of food scarcity caused by unusual drought, storms, or epidemics. It is interesting to note the foods used at these times.

During the regular annual periods of food scarcity which occur in certain backward communities, it is customary to make the chief food go farther by adding less appreciated foods. Thus in rice-eating sections ground corn is added to the morisqueta,[1] and more root crops are consumed. In corn-consuming regions the people resort to cultivated roots and even to wild roots and starches from wild palms. In the most backward communities the coarsest forms of wild food supplement the chief diet. In these localities the famine period is a real time of want when the hunger strap must be tightly drawn. Such annual periods of food scarcity occur of course only in the less progressive and poorer districts of the Philippines, but they are of enough importance to be noted as a condition and not an interesting exception.

From time to time extraordinary periods of restricted food supply occur in certain localities or throughout the Islands. In the most advanced and richest regions, in which there is diversity of production (as Laguna and Pangasinan), or where the land is given over to a successful export crop (as the present coconut region of Tayabas), drought has no very serious ill effect upon the people. But where the population is dependent upon one food crop or upon an export crop which brings a low price, the effect of curtailment in food supply is often keenly felt. Here again the results of the famine depend upon the character of the population. In the least civilized parts of the Philippines the people "take to the hills" and live upon roots and other wild food until they can plant and harvest another crop. In more advanced localities the people resort to less appreciated foods. In rice-producing sections corn is usually planted, since it furnishes food more plants. No attempt is made to cultivate carefully or to improve this root. As a general food the sweet potato attains its greatest importance just before rice planting. At all times of the year it is eaten between meals.

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[1] Boiled rice.

Of the numerous species of yams, several are found wild or cultivated and are probably the second most important supplementary food. These roots are sold in nearly all markets of the Islands, and their place in the diet of the people is much the same as that of the sweet potato. In certain localities they are used with sweet potatoes as the chief food, but in most places their value is purely supplementary in varying degrees. The yams are peculiarly immune to the effects of drought and are therefore excellent dry-season crops. Their food value lies almost entirely in the starch content.

Throughout the Philippines taro is found in all markets. This root, however, in no locality becomes the principal or even an important food. Its cultivation requires considerable water, and it therefore cannot be advantageously grown during the dry season except along streams. It is a starchy food.

The value of cassava roots as food is not well understood in the Philippines in general. In the Sulu Archipelago cassava is the chief food; in other parts, however, it is seldom used except in times of great need. Among other supplementary food crops may be mentioned the arrowroots, the millets, the beans, and the palm starches, but the amounts of these consumed in comparison with the foods noted above are small indeed.

FOODS OF LUXURY

Foods of luxury raised and eaten by Filipinos are neither numerous nor of great quantity.[1] The most important are the fruits. There is practically no fruit cultivation in the Philippines — no orchards or organized systems of obtaining and disposing of fruit. The trees are simply allowed to grow, and the product is gathered when ready. There is not a fruit grown in the Philippines the yield of which could not be increased in quality and quantity by careful propagation and cultivation. Mangos are quite generally produced and are exported from certain favorable localities in large quantities. Mandarins[1] are sent from the groves of Batangas and two or three small producing centers during a very short season. "Lansones," which grow here and there throughout the Archipelago, are exported principally from southwestern Luzon. Pineapples, chicos, guavas, tamarinds, papayas, and other fruits are produced locally and enter trade to a small extent.[2] Of these the papaya is the most utilized. In general, fruits contain but little nourishment in comparison to their bulk, and that usually consists of sugars. Fruits aid and stimulate digestion rather than give nourishment to the body. In the Philippines green fruit is preferred, and consequently the nourishment which is developed in the ripe fruit is lost.

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[1] Luxuries include foods eaten not for their nutritive value particularly, but as relishes at or between meals.

Unlike most fruits, however, the banana contains a large amount of nutritious substances and therefore has distinct food value, especially when cooked. The place of the banana in the diet of Filipinos is a peculiar one and varies with the variety of the fruit and the locality. The best kinds of bananas are always considered luxuries for the tables of the well-to-do and bring a relatively high price in all parts of the Archipelago. The commoner varieties are the chief food in a very few barrios[3] during the whole year or a large part of it. Probably in half the municipalities of the Philippines the banana is a recognized supplementary food and enters into the diet of the people as largely as do the root crops and corn. In as many municipalities even the most inferior varieties are considered luxuries, and very few are eaten. The cause of this great difference in the use of the banana lies entirely in the inadequate local production, due to neglect or unfavorable situation. In no place in the Philippines is the demand for bananas supplied. Around Manila, Cebu, and Iloilo there is a small trade in the fruit, and it is found in the markets of most towns. The largest supply of provincial householders is obtained from plants grown in their own yards.

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[1] Known locally as the Batangas orange.

[2] For discussion of these fruits see "Commercial Geography, the Materials of Commerce for the Philippines," by Miller, Bureau of Education, Manila.

[3] The Philippines are divided politically into provinces, municipalities, and barrios.

Other domestic vegetable luxuries consumed by Filipinos are sugar, onions, garlic, coffee, chocolate, buyo (betel), tobacco, and certain fermented drinks such as palm saps (tubà) and "basi." Sugar enters the composition of numerous sweetmeats (dulces) made from other foods already mentioned and the meat of the coconut. Garlic and onions are greatly appreciated for flavoring foods. By those who can afford them, coffee or chocolate are drunk with the morning meal, and chocolate in the afternoon. The smoking of tobacco is a luxury freely indulged in by all classes. The chewing of buyo, however, seems to be growing less. The wide consumption of distilled liquors will be discussed in another place. Fermented juices are also very important. In the Visayas immense quantities of fermented coconut sap are drunk, and among the Ilocanos fermented sugar-cane juice ("basi") is used by all classes. A small amount of fermented nipa sap is consumed near extensive swamps covered with nipa palms.

Famine Foods

In the discussion of the chief food crops it has been intimated that famines occasionally occur in the Philippines. This term, however, is almost too strong a word to apply to any conditions found in the Islands. It usually brings to mind periods in India and China when thousands upon thousands die from actual want of food. Such a condition, however, is not even approached in the Philippines. In the worst times a few hundred persons, mostly old people and children, may die of malnutrition. The Philippines are not densely populated, and in times of necessity the people can resort to wild foods. Two in number and in which the differences are more marked; (2) they calculate their profits not as a percentage of money invested but as a certain amount per picul, and hence they can make larger profits on lower grades, since with a given sum of money they can buy more piculs of lower-grade fiber than of the higher grade.

Price

The price received for abaca fiber may best be discussed from a historic standpoint. Chart VI shows graphically the history of abaca exports and prices from the year 1877. From the heavy smoothed line it can be seen (Fig. I) that the export of abaca has steadily increased, the extremes being 37,000,000 kilos in 1877 and 170,000,000 kilos in 1910. From Fig. II it can be seen that in the period 1877–1895 the price rose and fell twice without great fluctuation, and that in the period 1899–1912 it again rose and fell.

It will be noted in this figure also that the drop in price from 1907 to 1911 was particularly rapid. This decrease in the price of abaca has had great influence on the industry in the Philippines, and warrants careful consideration. Such a drop may be the result of several conditions, of which the following are probably the most important: (1) the competition of agave fibers, of which there has been a large production and which are cheaper than abaca, with the lower grades of Manila hemp; (2) overproduction of abaca fiber combined with a general falling off in demand, the result of lessened industrial activity in Europe and America; (3) a buying monopoly either in the Philippines or in the United States and Europe, or in both.

As has been previously stated, prices obtained for the lower and the higher grades of abaca in the early years of American occupation were such as to encourage the production of lower grades. Consequently the standard of production was constantly lowered through neglect of the fields, the use of serrated knives, and poor curing. The fiber thus quickly than rice and requires less water. In many parts of the Islands more yams and vegetables are also eaten at such times. The most important sources of nourishment during the scarcity of cultivated foods are the palm starches. In some places palm starches are regularly included in the diet, as, for instance, buri starch on the Bondoc peninsula, the starch of the sugar palm in Mindoro, and the starch of the sago palm in the northeastern portion of the Agusan valley. But for the Philippines in general the palm starches may be considered foods of necessity, used only in times of scarcity. In coconut regions tubà is drunk to a larger extent during food shortage and, with a little rice and fish, or corn and fish, in the middle of the day, sustains life until the next harvest.

New Food Crops

Certain food crops now not at all or but little produced are worthy of much greater attention than they receive in the Philippines.

Among these the most important are beans. Three general classes of food are recognized as necessary for the proper nourishment of the body: the carbohydrates, which are obtained from starches and sugars; the proteids, which are found in fish, meats, beans, etc.; and the fats, which may be either animal or vegetable. The diet of the Filipino is plentifully supplied with fats from pork and coconut oil, which are universally eaten. The proportion of starchy foods consumed by the Filipinos is too great. Rice and roots are almost entirely starch. Corn contains considerable protein but is essentially a starchy food. At the present time protein is supplied largely by fish, to a less extent by meat, and to a still less extent by beans. In certain localities (particularly on the island of Panay and among the Ilocanos) beans are a notable feature of the daily food. Yet even in these places the nutritive value of beans in connection with rice is not well understood. The chief reason for eating them is that they can be grown between main crops. For the Philippines as a whole beans are much too sparingly used. The varieties found in the small stores and markets of most towns are principally imported from China. Those grown by individuals are consumed by the family or in the immediate locality, except in a very few cases, as in Ilocos Norte, Pangasinan, and Antique, from which beans are exported.

The most important varieties of beans grown in the Philippines are the cowpea, which is usually eaten green; the lima bean, which is found both wild and cultivated; and the green gram, which is the most important of the local beans and is valued for its dried seeds. All these varieties are rich in protein. The use of beans in crop rotation with starch-producing plants is not understood in the Philippines. Their cultivation in connection with rice, corn, and root crops would better agricultural conditions and furnish the necessary protein to the diet of the Filipinos. The present varieties grown are suitable, but others might be introduced. Recently world-interest has been taken in the soya bean, which is produced

A VEGETABLE GARDEN

and eaten in large quantities in China, Japan, and India. This bean is an extensive source of oil there and in Europe, and its general food value is becoming recognized to an ever-increasing extent. It is very rich in fat and protein, and contains practically no starch. This bean is not well known in the Islands, although quantities are imported from China and made into bean cakes or curds, which are an excellent food, very popular in the larger cities of the Philippines. This bean would be a good addition to the crops and foods of Filipinos.

AN EXHIBIT OF VEGETABLES FROM SCHOOL GARDENS

Results of propaganda on vegetables

The diet of the Filipinos is also deficient in fresh vegetables. After all, variety in diet is largely a matter of habit, and the customs of the Filipinos have been such as to eliminate almost all fresh vegetables except "greens" from their table. Near most houses in the Philippines there is a large space in which a vegetable garden could easily be maintained, the product of which would be important not only in lending variety to diet but also as food in times of scarcity. The schools in all parts of the Islands have recently taken up with great earnestness the planting of school and home gardens. According to the report of the Director of Education, in 1912, about 2500 school gardens and 23,000 home gardens were cultivated during the year. In nearly all towns there is a noticeable increase in the number of gardens around the houses and in the amount of fresh vegetables eaten.[1]

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[1] For a summary of the chapter on food crops see Chapter XIII under the heading Standard of Living.

CHAPTER V

EXPORT CROPS — ABACA

The food crops of the Philippines are produced for consumption in the Islands. With the exception of rice they enter commerce hardly at all. Even rice is sent away from only a few districts.

The export crops, on the other hand, are grown almost entirely for use in foreign countries, only a small part of each being consumed in the Islands. In exchange for these crops there are brought into the Philippines (1) necessary articles which cannot be made here or which can be produced more cheaply in foreign countries, such as iron and steel goods and cotton cloth; (2) food, such as rice; and (3) luxuries, such as canned goods, phonographs, shoes, and books. It is probable that the export crops equal in value those raised for local consumption.

History of Abaca

For many years the most important export from the Philippines has been Manila hemp. The fiber-producing qualities of the species of *Musa*, called in the native languages abaca, was well known to Filipinos long before the days of Spanish occupation. When Magellan arrived at Cebu, the weaving industry was already widespread in the island. Levariza (1569) spoke of the great quantities of colored abaca cloths produced in the present province of Albay. Since this weaving industry was widespread, and the use of the cloth by the natives was general, the Spanish government made the cloth legal tender for the payment of taxes. However, although weaving was a common household industry, this peculiar form of money was not easily obtained, and long arguments concerning the hardship of the payment appeared from time to time in letters written to the Spanish king.

All the fiber in ancient times was obtained from the wild plant. The cultivation of abaca was not begun until the early part of the nineteenth century, and some was exported in 1818. In 1824 the fiber was used quite extensively in New England shipyards. The amount of abaca exported, however, was not large until the latter part of the century. From 1850 to the present time production and export have increased rapidly; Fig. I on Chart VI shows the increased volume of this export fiber from 1877 to 1912 inclusive.

The popularity of abaca in those regions in which it can be grown[1] is probably due to these facts: it is not attacked by pests, such as locusts (which are so destructive to rice and other crops), or by any serious fungous diseases; it resists drought fairly well; much labor need not be expended upon its cultivation, since it thrives in competition with other plants. Moreover, it has no particular season for harvest, and the laborers have more or less steady work throughout the whole year.

LARGE AND SMALL PRODUCERS

In parts of the Philippines the fiber is still obtained from uncultivated varieties, although this product is inferior to that stripped from cultivated plants. In the older abaca districts the holdings are usually very small, consisting at the most of a few thousand hills. These holdings are sometimes owned by the men who strip the fiber, and sometimes by the people who live in the lowlands. Such small holdings are probably the result of local scarcity of labor and the general immobility of labor. They also result from giving one family the care of just the number of plants they can cultivate and harvest. The small owners and producers are nearly always economically dependent on certain provincial abaca buyers. Through advances of money or food these buyers control to their own advantage the disposal of the debtors' product. The owners of several thousand hills are in a much better position and are usually economically independent of all buyers. In many of the newer abaca sections there are plantations of more than a hundred thousand hills, the owners of which are usually corporations and are, of course, quite independent as to the disposal of their fiber.

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[1] See Miller's "Commercial Geography, the Materials of Commerce for the Philippines."

STRIPPING

The amount of labor involved in planting abaca and in cultivating the plot ("laté") or hacienda is comparatively small, but for the Islands as a whole sufficient labor to strip the fiber from the petiole has never been available. Most of the fiber is obtained by the very laborious process of pulling the petiole under a knife by hand, as shown on page 79. This process requires not only great dexterity but also great strength. The problem of the abaca owner is therefore to find sufficient labor to strip his fiber. The wages of strippers usually consist of a certain share of the product. Formerly it was one third, but for several years it has been one half of the fiber obtained. In certain places in which labor is particularly scarce, and which were particularly hard hit by the slump in prices of the last few years, even more than a share of one half has been given the strippers, but on condition that the stripper also cultivate the "laté." It is considered obligatory on the stripper to sell his share to the owner of the plantation as long as the latter pays a reasonable price for it, this price being slightly less than that of the open market. Hence, in the end, the total product of the plantation usually passes into the hands of the owner. In a few large plantations daily wages are given.

In 1903 hemp strippers could earn from ₱2.00 to ₱2.50 a day.[1] At the low prices of 1911, however, a laborer could not make more than half that amount per day. Because of the laboriousness of stripping, it is not customary for the stripper to work continuously nor longer than is absolutely necessary. Hence, no matter what the price is, the stripper's annual income is probably no greater than that of laborers working in other agricultural pursuits.

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[1] *Bulletin 58*, Bureau of Labor, Washington, D.C.

The stripper in most abaca districts is quite dependent upon this crop for a living, and usually dwells with his family upon the "laté." He himself does not raise any food crops or domestic animals suitable for food, nor is he encouraged to do so by the man for whom he works. This condition, as we shall see later, results in an exodus of strippers from the abaca fields to the rice fields when the price of the fiber is so low that stripping does not yield a good living.

TRANSPORTATION

Another important consideration in the production of abaca fiber is that of transportation. Usually the abaca "latés" are in the hills, and the cost of getting the fiber to the coast, where river transportation is not available, is often a very difficult matter. When the price of abaca was high, as in 1903 (see Chart VI), it paid the strippers to carry the product by horse or carabao, or even on their own backs, over trails or across mountains to the nearest coast towns to exchange it for rice and cloth. From these places it was taken to Manila or Cebu for transhipment to foreign countries. When the price of abaca dropped, however, strippers no longer obtained enough goods for their load to warrant carrying the fiber to market, and many interior sections, such as the mountains of Samar and the Bukidnon country of Mindanao, practically ceased to export. In general, when the price is low, much abaca goes to waste on the stalk in those regions from which transportation to the market is an expensive item.

QUALITY

The quality of abaca fiber is an important consideration and can be controlled in the stripping. The abaca exported from the Philippines has deteriorated greatly, as can be seen by comparing the exports of 1881 with those of 1903 as reported by a certain firm. This comparison has been given in graphic form in Chart V. It will be seen that by 1903 the second grade, which composed 61.8 per cent of the product of 1881, had almost disappeared; that the largest part was fourth grade, very little of which had been produced in 1881; and that a new or fifth grade was being largely produced. The general quality of the fiber has become even lower since 1903. This lowering in quality results from (1) the use of a serrated knife which gives a larger yield with less effort, but obtains a coarse abaca discolored by pulp; (2) delay in stripping the separated petioles; and (3) careless drying, due to the neglect on the part of the stripper in not immediately placing the fiber in the sun to dry, and in not protecting it from the rain or other forms of moisture which cause discoloration and reduce the strength of the fiber. These causes tend to produce coarse, spotted-brown fiber of uneven strength, instead of the long, soft, "white" fiber uniformly cleaned and of uniform strength. It is said that in former times it was customary for the authorities to burn inferior fiber in order to discourage its production. The marketing of the lower grades injures the reputation of abaca fiber, and lessens the demand for it in the world's markets by inviting competition from inferior rope fibers.

It would seem, however, that the local provincial buyers have been largely responsible for the production of lower grades of fiber in the Philippines. In 1903, during actual cleaning experiments made at Gubat, Sorsogon,[1] it was shown that during the first hour $1\frac{1}{2}$ kilos of high-grade fiber valued at 70 centavos could be produced with a smooth-edged knife.

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[1] *Bulletin 58*, Bureau of Labor, Washington, D.C.

and about 3 kilos could be cleaned with a serrated blade, the value of the latter being 94 centavos. At wages of half the product, therefore, the stripper obtained 35 centavos per hour by stripping the high-grade fiber, and 47 centavos per hour by stripping the lower-grade material — a difference of 12 centavos an hour. This discrepancy in favor of lower grades still persists. In other words, the provincial middlemen took large profits from the higher grades and reasonable profits from the lower grades. As a result the producer was left less return per hour of labor on the higher grades than on the lower grades. It is not, however, the fault of large dealers and exporters, but of local buyers. For instance, in 1912 at Gubat, Sorsogon, good current fiber was selling at ₱25 per 100 kilos, which would have been worth ₱40 in Manila — a profit of 60 per cent to the buyer; at Tabaco, Albay, current United States fiber selling in Manila at ₱28 brought ₱20 — a profit of 40 per cent; and so the percentage of profit became less as the grade became lower. The inferior grades noted in the table on page 72 brought only a reasonable profit.[1]

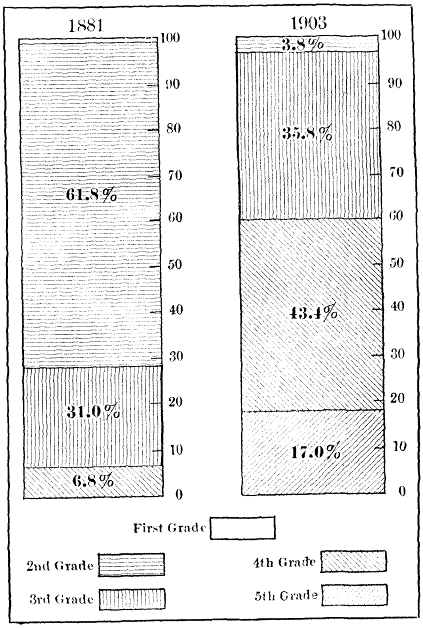

CHART V. PER CENT OF ABACA FIBER OF EACH GRADE SHIPPED BY A SINGLE FIRM

Data from *Bulletin 58*, Bureau of Labor, Washington, D.C.

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[1] From data by the Fiber Expert, Bureau of Agriculture, Manila.

RANGE OF PRICE FOR ABACA PER 100 KILOS IN MANILA FOR SEPTEMBER, 1912[1]

GRADES		
300% over good current	F.E.A. quality about	₱57.50–60.00
250% over good current		
200% over good current		
150% over good current	F.E.B. quality about	45.50–51.00
100% over good current		
50% over good current		
Good current		39.50–42.65
75% over current about		37.00–40.00
50% over current or midway		35.45–38.50
25% over current		30.65–33.20
Current United States		26.85–28.45
Current United Kingdom		18.10–19.90
Superior seconds		15.80–17.40
Good seconds		14.85–15.80
Fair seconds		14.00–14.50
Good brown (red)		13.60–14.20
Fair brown (red)		12.80–13.50

In most districts, therefore, the difference in price between the higher and lower grades is not enough to encourage small producers to turn out better fiber. The encouragement to produce low grades is even more pronounced in those regions in which the friction of trade actually equalizes the buying prices of all grades of abaca. It should be noted, however, that the large, independent producers, who sell to Manila dealers direct, find it most profitable to strip a high-grade fiber;[2] but the outlook of the small producers does not extend beyond the provincial buyers, who control the disposal of their product. The attitude of the local buyers is probably due to these two reasons: (1) they do not themselves well understand the shades of difference between the high grades of the fiber, and therefore feel safe only in buying the lower grades, which are fewer rectangles.[1] It will be noted that in rectangle 1 the broken line, which indicates the price of abaca, and the unbroken line, which represents the export of abaca, increase in about the same proportion. In rectangle 2, while there is an increase in abaca export there is a fall in the price. On the other hand, in rectangle 3 decrease in the amount of abaca exported is accompanied by increase in the price. In rectangle 4 there is a marked rise in abaca exported and a very marked fall in price. No figures are available for war times, but it is evident that the world's markets were undersupplied with abaca fiber. Hence in the years 1899–1904, years of great prosperity in the United States and Europe, increase in the exports of abaca are accompanied by increase in price (rectangle 5). After this period (rectangle 6) there is again a decrease in the abaca exported, probably due to the drought of 1903, while prices still continue to rise. Rectangle 7 shows the last great increase in abaca exports, which are again accompanied by a marked fall in the price. From this comparison of relative increase and decrease in price and export of abaca fiber, it would seem quite probable that the fall in price of abaca during the period of 1907–1911 was due in considerable degree to the correspondingly large increase in the production and export of the fiber during that time. This increased production was caused by large plantings, beginning with the years 1902–1903, which in turn had been brought about by the high prices and profits for abaca prevailing at that time.

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[1] Information from the Fiber Expert, Bureau of Agriculture, Manila.

[2] It was estimated by the Fiber Expert that at the prices prevailing in September, 1912, the value of the abaca output of the Bicol peninsula (85,000 T.) was worth ₱18,200,000. Had the petioles been stripped carefully, a yield of 68,250 tons would have been obtained, valued at ₱28,712,000.

In 1907 there were panic conditions in Europe and the United States, and industrial affairs were weak for a number of years. In 1908–1909 there was a reoccurrence of panic conditions. At such times those industries in which much abaca is used, particularly engineering industries, are most seriously affected. Hence it is probable that the fall in price of abaca from 1907 to 1911 resulted from overproduction and the general weak condition of industrial affairs.[2]

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[1] These lines are drawn to a logarithmic scale.

[2] Such cycles occur with all commercially well-established products.

produced was not superior to sisal, henequen, Mauritius hemp, and New Zealand hemp, and its price was consequently reduced to that of these cheaper rope materials.

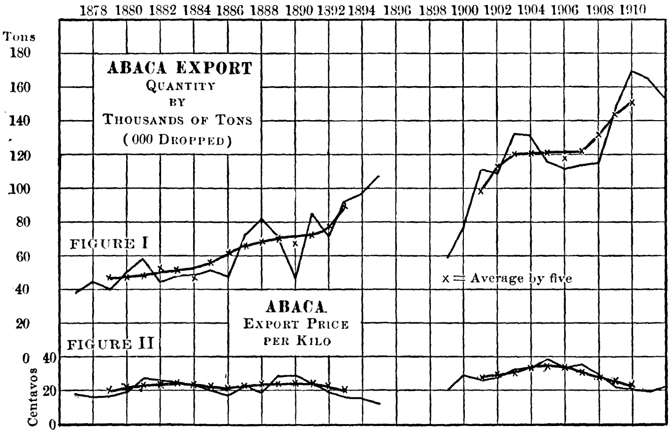

CHART VI. PHILIPPINE ABACA EXPORTS

Census and Customs Statistics

While not so much affected, the higher grades of abaca fiber have also brought a lower price in the world's market. This cannot be explained by competition, since no fiber equals the best abaca in rope making. Referring again to Chart VI,

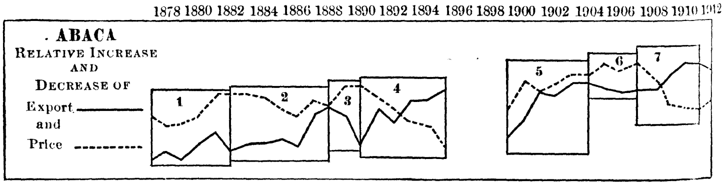

CHART VII

it will be noted that in the period 1907–1910 the rapid decrease in the price of abaca is coincident with a rapid increase in its export. For the purpose of comparing other periods in the history of abaca, the lines showing relative increase and decrease in export and price have been placed together in Chart VII, and periods in this history have been indicated by abaca in value. This advance came about not only through greatly increased amounts of copra exported but also through its advancing price, which in the period under discussion increased about 100 per cent (see Chart XII).

Increase in Yield

While the coconut industry is more flourishing than any other in the Philippines, certain conditions which are liable to affect it adversely should be understood. Mr. O. W. Barrett of the Bureau of Agriculture has estimated that the coconut production in the Philippines could be increased one fourth without increasing the area of production, if proper cultural methods were followed.[1]

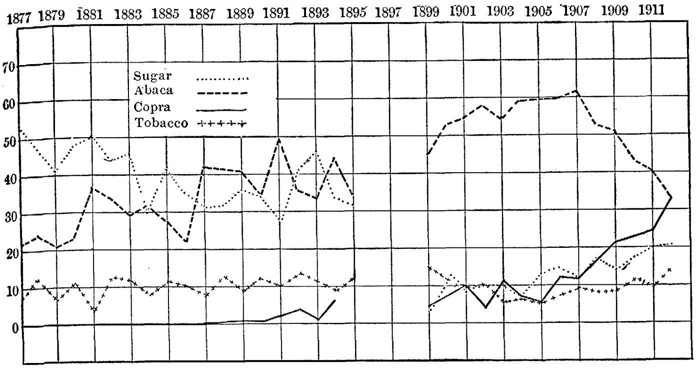

CHART XI. FOUR PRINCIPAL EXPORTS OF PHILIPPINE ISLANDS

Percentage of value of total exports

Two plantings are found — groves owned by large landholders or combinations of landholders, and patches around the homes of small farmers. The matter of seed selection and of ample space between rows and between plants in the row is of as great importance as in corn production, and has received as little attention from coconut planters. The growth

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[1] See *Farmers' Bulletin No. 17*, Bureau of Agriculture, and the *Philippine Agricultural Review*.

In the latter part of 1912 there was a rise in the price of abaca (not shown on Chart VII, in which the fiscal year is used). The low prices which abaca fiber was bringing greatly reduced the amount of stripping from the old plantings. During drought the growth of abaca stops and no petioles mature for stripping. Some plantations were almost destroyed in the drought of 1911–1912. In others it was impossible to strip fiber for several months. Estimates placed the shortage at from 20 to 60 per cent of the previous year's output. Hence it appears that these two causes would result in a marked falling off of abaca production. Moreover, in 1912 the Philippines began to feel the quickening pulse of industry in Europe and America in increased demand for abaca fiber. If prices had not risen, enough fiber would not have been produced to meet this demand. Even if buying firms were in agreement, they would have been compelled to raise their buying price to the producers. In the space of a few weeks prices rose to the point at which they had been in 1907, an increase of 100 per cent and over.

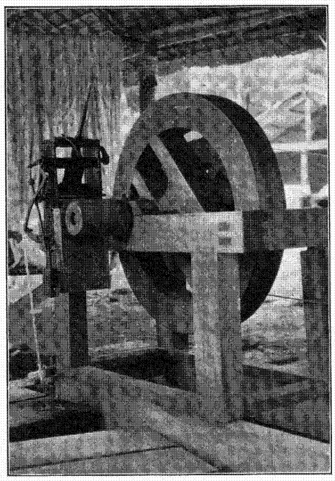
As to a buying monopoly, nothing definite is known, though it has often been stated that a monopoly, controlling both the Philippine and foreign markets, exists in the abaca trade. It is obvious that such a monopoly could be easily established, since the whole industry is concentrated in the Philippines, — practically in the two ports of Manila and Cebu, — and almost the whole product is sent to London or New York.

PROBLEMS TO BE SOLVED

The problems of the abaca industry are as follows:

1. To raise the quality of the product. The present low grade results from the kind of knife used and from neglect during the process of curing the fiber. If the incentive of higher wages existed, better grades would be produced by strippers. Such incentive does exist in the difference in export prices for high and low grades, but it does not exist in the provincial

markets, where ignorance and poor methods practiced by buyers tend to encourage the output of low grades by equalizing prices for all qualities of fiber. The grades of abaca should be so standardized that foreign merchants can order their fiber direct from the Philippines, and know the exact grade which they will receive. At the present time each firm keeps to standards that it has established. The general standardization of abaca would seem the function of the government, and should be applied not only to Manila and Cebu but to all provincial buying centers. Experts in the baling centers could easily classify the fiber and certify to the grade. Such a classification would be understood in the provinces and the resultant adjustment of prices would encourage the production of higher grades.


A SIMPLE MECHANICAL ABACA STRIPPER

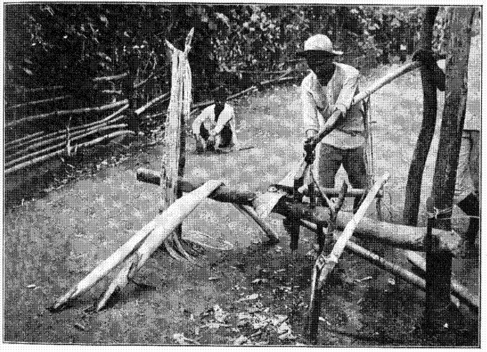
2. To increase the size of holdings and decrease the number of middlemen handling the fiber. The present system of small holdings is very wasteful, and the fiber is handled by too many men before reaching the exporter. Larger, well-cultivated plantations in which there can be division of labor, and the product of which will warrant transportation

facilities to the coast, will prove more profitable and will yield higher-grade fiber.

3. To secure machinery for stripping. In the periods when abaca fiber brings a high price not enough labor can be secured to strip it. In the periods when the fiber brings a low price the laborers either refuse to work for the small wages received or insist on having a larger part of the product. The invention of successful abaca-stripping machines would solve the labor problem. Such machines have long been used in the production of sisal fiber. In the last ten years numerous abaca-stripping machines have been invented and experimented with in the Philippines. As yet, however, none of them has been successful enough to be generally adopted, either because they do not turn out a good grade of fiber, or do not turn out fiber rapidly enough, or because they are so large that they require much power to operate and so heavy that they cannot be transported, with the result that expensive provision must be made for carrying the petioles to a central point. In hilly or broken country or in regions of small, scattered plantations only the smallest machinery would be practical. Successful stripping machines of large capacity might ultimately cause overproduction and lowering of price, and would shut out small producers and encourage large plantations.

FUTURE OF THE INDUSTRY

It has been stated that the lowering in the price of abaca has greatly affected the industry. From Chart VI it will be seen that the general export price fell from 36.6 centavos in 1907 to 19.4 centavos in 1911, a drop of almost 50 per cent, which especially affected the lower grades. As a result, production was greatly curtailed in regions such as Albay, where the lower grades of fiber are produced, and in the interior of Samar and in the Bukidnon country, where the cost of transportation to the coast is an important factor. In the lowland regions producing a high-grade fiber, such as the lowlands of



Hand Stripping

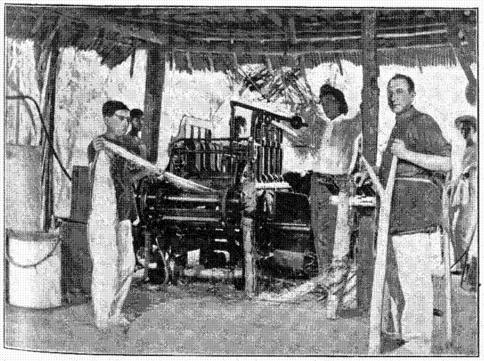


Photo by Bureau of Agriculture

A Stripping Machine

STRIPPING ABACA

Samar, Leyte, and Davao, the drop was not felt so keenly. In many localities in which abaca could no longer be produced at a profit the fields were allowed to grow up in jungle. In some places abaca has been grubbed up and the land planted to coconuts. At the present high prices obtained for copra, this cultivation will be much more profitable than the growing of abaca, and will furnish an export product obtained with considerably less labor. If the present rise in price of abaca does not give it a new lease of life, the industry will undoubtedly die out in districts producing a low-grade fiber unless the establishment of simpler standards and their observance by local buyers results in the increased production of higher grades.

The rise in price which occurred in 1912 was probably due to (1) the expected decrease in production resulting from the low price; (2) drought; and (3) the prospect of good crops in the United States, which usually causes strong demand for binder twine. This rise in price has encouraged abaca owners to renew their activity. In many places, however, they are unable, because of the lack of labor, to take advantage of the higher prices. As has been stated, strippers were dependent for their living upon abaca fiber. They grew no food crops around their houses, and consequently when the price of the fiber dropped below the point at which they were warranted in obtaining it, these men left the "latés" and sought work in other agricultural occupations, especially rice cultivation. Sometimes they remained in the same locality, but as often went to other places. Thus when their services were again needed, many of them were no longer available.

Whether the present general increase is accidental or one which will continue, is a question which cannot be decided at this time. The price of abaca fiber will always be governed by world demand and local supply, and will rise and fall with the impulse of industry in Europe and America and with local weather conditions. With high prices even the careless owner and the producer of inferior fiber will make money. With a low market he will be forced out of producing, while the careful, systematic planter and the producer of higher grades will still find abaca a very profitable crop.

Up to the last few years almost the entire export of abaca from the Philippines has been used in rope manufacture, for which purpose the best fiber has no substitute. Since historic times Filipinos have woven a cloth known as sinamay from the fiber, though it is probable that the amount so used in the Philippines has never been over 10 per cent of the total production. Within the last few years, however, other uses have been found for abaca fiber. The knotted yarn used in the production of sinamay has been exported in increased quantities to be made into hat braids and coarse material for stiffening clothes. In 1912 this export amounted to ₱1,231,538 and the export of loose abaca fiber to ₱32,567,020. For many years a strong wrapping paper has been manufactured from old rope. Recently the waste from abaca stripping has been exported for this purpose, and, with the low price of the fiber, there has been established in one province a factory which prepares and dries the whole petiole for shipment to the United States, where it is made into paper. Recently, also, lupis (strips of the fiber with the pulp attached) has received considerable attention. It is probable that these new uses for abaca fiber are but beginnings. Its strength and its resistance to water commend it for art use as much as for rope making, while the beautiful tones to which it can be dyed, and its luster, make it an excellent material for art objects.

CHAPTER VI

EXPORT CROPS — COPRA

HISTORICAL

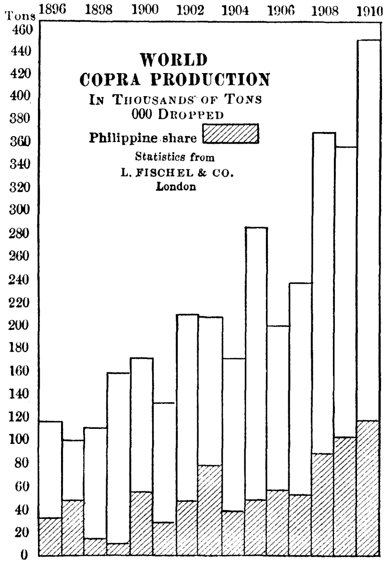


CHART VIII

Before the arrival of Europeans in the Orient the coconut palm was already a most important plant, and the meat, oil, sap, fiber, and other parts and products of the tree were being utilized. It is evident that coconuts were a large crop in Ceylon long before the days of the Portuguese, for upon their arrival they noted that the southeast coast of the island was a vast coconut grove. The Dutch gave great impetus to the industry in their Eastern colonies by encouraging the production and export of coir fiber.[1]

As late as the first quarter of the nineteenth century Europe knew little of the value and uses of coconut products. About that time a certain captain of Aberdeen took home a cargo of oil, but had considerable difficulty in disposing of it. It was finally bought by a woolen mill and utilized as lubricating oil.

The recognition of the properties of coconut oil, which has placed it among those most highly esteemed for human consumption, did not come about until the latter part of the nineteenth century. For manufacturing purposes coconut oil was first utilized in large quantities for high-grade soaps and candles. Because of the advancing price of animal fats (butter, lard, and the like) there has been a growing tendency to substitute for them products from vegetable oils. Cottonseed and peanut oil are used to a large extent, but coconut oil, because of all the oils it most closely resembles butter in its composition, and because of its high melting point, is the most suitable for the purpose. Various persons and countries claim the credit for beginning the manufacture of imitation butter and lard from coconut oil. At the present time the most important producers and consumers are Germany, France, and England. This industry is particularly large in Germany, where millions of pesos are invested in it, and an elaborate system for producing and distributing the product has been developed. Not only is the consumption of this product increasing in these countries, but its manufacture and use is spreading in other parts of Europe and in America. In the meantime increased amounts of oil have been utilized in soap and candle making, the large consumption of whole nuts has continued, and the production of desiccated coconut has increased. As a consequence the output of copra has not kept pace with the increased demand, and prices have risen. The adjustment of demand and supply in the product of a long-time crop like copra covers a long period of time. New plantings of coconut palms produce full yields only after seven years of growth.

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[1] J. Ferguson's "Coconut Planters' Manual."

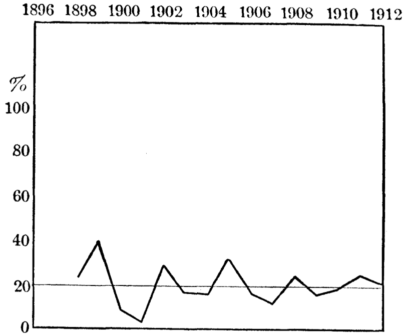

CHART IX. PER CENT OF WORLD'S COPRA SHIPMENTS FROM THE PHILIPPINES

Statistics from L. Fischel & Co., London

PHILIPPINE PRODUCTION

Coconut-oil production is discussed in terms of copra, since it is this dried meat of the nut that is exported to the oil-consuming countries. The Philippines now export more copra than any other country. Chart VIII shows graphically the gradual increase of the world's copra export and the portion of it which originated in the Philippines. From Chart IX it will be seen that on the average the Islands have usually been credited with about one fourth of the world's output. Java exports have advanced relatively more and Singapore exports relatively less than Philippine exports. In general, therefore, it may be stated that the Philippines are keeping their position as the chief exporter of copra.

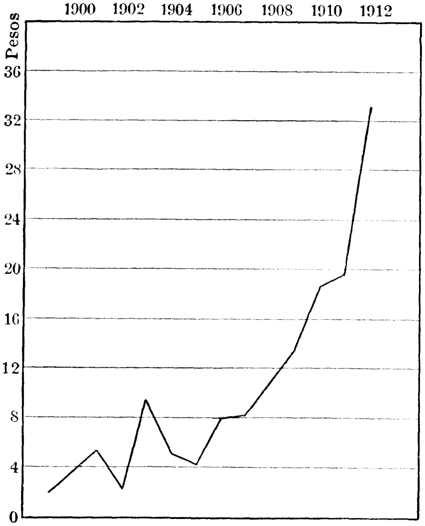

CHART X. PHILIPPINE COPRA EXPORTS IN MILLIONS OF PESOS

Customs Statistics

Statistics given thus far have dealt only with the amount of copra; but if the value of this export from the Philippines is considered, its importance is even greater. This is shown in Chart X. Chart XI shows the varying degrees in which sugar, abaca, tobacco, and copra have entered the export trade of the Philippines. Although copra in 1899 was the least important of the four staple Philippine export crops, in 1912[1] it exceeded

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[1] Figures for abaca do not include knotted abaca. Since eight ninths of the cost of knotted abaca results from the labor of tying it, the relative positions of abaca exports and copra exports would be little changed by adding the value of fiber only.

CHAPTER VII

EXPORT CROPS — SUGAR[1]

EARLY HISTORY

Sugar cane as a wild plant is not known, but its early home was probably in Bengal or Cochin China. Botanical, linguistic, and historic facts support this theory. Sugar was first mentioned[2] in Chinese writings of the second century B.C. In 86 A.D. the kingdom of Funan sent a tribute of sugar to an emperor of the powerful Han dynasty then ruling China. In the seventh century the Chinese emperor Taitsong, carrying out a well-defined policy for increasing the prosperity of the realm, sent a man to the Indian province of Bahur to study the methods of sugar making. The embassy seems to have been successful, for when Marco Polo visited China, six centuries later, he found that large quantities of sugar were produced there. The industry also flourished in other parts of the East. Vasco da Gama, visiting Calicut in 1497, found the sugar trade of that port worthy of special mention.

While the sugar industry was thus becoming well developed in the East, a definite knowledge of the product was advancing westward, largely through the agency of Greeks, Saracens, and Venetians. About the fourth century B.C., Alexander the Great invaded India and is said "to have feasted on solid honey, not made by bees, which was procured from the stem of a reed." The Greeks called the new substance "Indian salt."

According to Seneca and Pliny the Elder the fame of both India and Arabia as producers of sugar was well established in of weeds, grass, and underbrush in coconut groves greatly reduces production, and, together with rubbish, dead leaves, and dead tree trunks, helps to provide breeding places for coconut pests. In important coconut regions one now sees groves which are kept clean either to prevent insects breeding, or because coconuts are hard to find in underbrush. However, in most places both large and small groves remain uncleared.

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[1] By Charles H. Storms.

[2] W. C. Stubbs's, "Sugar Cane."

The amount of copra produced in the Philippines is greatly lessened by pests, storms, and drought. The most destructive of the coconut pests[1] are as follows: (1) insects, (2) mammals, (3) birds, (4) diseases. Of the insects the beetles are by far the most harmful, particularly the "uang," or rhinoceros beetle,[2] which attacks the bud of the palm. It is well distributed throughout the Philippines, and has also caused a tremendous amount of damage in oriental coconut groves and millions of pesos, loss. Another harmful beetle is the red weevil,[3] which bores into the trunk of the palm. Zamboanga, Laguna, and Oriental Negros are known to be infected by it, but no serious outbreaks have recently occurred.

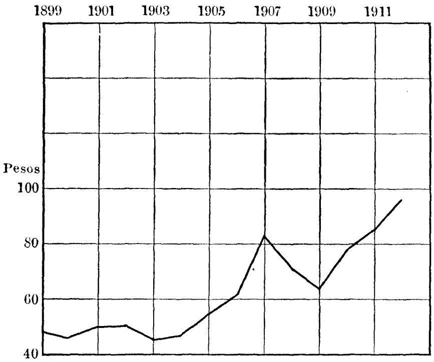

CHART XII. PHILIPPINE COPRA EXPORT. PRICE PER METRIC TON

Customs Statistics

The rhinoceros beetle breeds in rubbish formed by old leaves, husks, and the like, and in old trunks and stumps of palms. The red weevil enters the trunk of the palm through wounds and lays its eggs. The grubs bore cavities and finally destroy the tree. The prevention of these weevils rather than their slaughter is the only possible remedy, and this must be effected by the elimination of all rubbish and dead palm trunks and stumps within and near the plantations, and by the burning of all trees seriously affected by the red weevil. Thus cleanliness is one of the first rules of coconut cultivation.[1] In certain regions where cleanliness is not observed, loss to the coconut crop may reach as high as 50 per cent. At Jiménez, Misamis, a whole coconut grove has been destroyed by the rhinoceros beetle. Several other beetles and weevils attack Philippine coconut groves, and there are scales which do more or less damage and often kill young trees; but the destructiveness of these in comparison with the two insects first mentioned is slight.

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[1] *Philippine Agricultural Review*, Vol. V, No. 5.

[2] *Oryctes rhinoceros.*

[3] *Rhynchophorus ferrugineus.*

Including these two beetles, there are in the Philippines to-day at least eighteen insect coconut pests, six of which are important and two of which are very dangerous. In comparison with other countries, however, the loss from such pests in the Islands is small, and if care be taken, these can easily be controlled.

Certain animals and birds also prove harmful. Fruit bats, monkeys, and crows eat the fruit of the coconut palm. In sparsely settled communities the wild pig is a menace to young plantations, since it roots up and devours the seedlings, and can be kept away only by means of strong fences. The wild pig is especially harmful in the Moro country, where in a single night hundreds of trees may be destroyed in one grove, if a hog-proof fence has not been built around it.

Bud rot is the most serious of all fungous or bacterial diseases attacking the palm, and is known in all coconut regions. In certain countries, as Cuba, it is a serious menace, and the Philippines have suffered one bad outbreak in the last decade. No cure is known for this disease, and palms attacked should be immediately cut down and burned, or buried with lime.

Extraordinary droughts are also injurious to coconuts, but as these seldom last a considerable length of time, they do not greatly reduce the crop. In certain regions, however, typhoons are very destructive, particularly in the belt in which Capiz Province and Samar are situated. The high winds blow the nuts from the trees and strain the plants themselves so that production is lessened. In 1908 a particularly severe typhoon passed over the region just mentioned. It is estimated[1] that the production of copra on the island of Romblon for the year 1909 was 15 per cent of the normal, for the year 1910 about 25 per cent, for 1911 about 40 per cent, and for 1912 about 60 per cent. This falling off was due to the effect of the typhoon, from which it is estimated it will take five years to recover. Similar reports come from Samar and the mainland of Capiz Province.

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[1] In the Straits Settlements and in Moro Province laws exist to compel owners to destroy rubbish and other breeding places.

INCREASE IN QUALITY

While the loss from poor planting and cultivation, pests, and drought is considerable in the Philippines, the loss from poor harvesting and drying is the largest item of all.

The percentage of green meat is very large in Philippine copra. Green nuts are plucked for several reasons. In many districts loss by thieves is very great, and owners prefer to be sure of the green nuts rather than run the risk of losing ripe ones. Constant need of ready money causes the small owners to pick the green nuts and cure them for immediate sale, instead of waiting for larger returns from mature ones. The nuts in the cluster do not ripen together. In the system of cutting nuts from the palm, however, the tendency is to harvest all at one time. Coconuts should not be picked, cut, or thrown down from the trees. When they are ripe they fall of their own weight and should then be gathered. The highest-priced copra in the market to-day comes from the Malabar coast of India. In that region only nuts which have fallen to the ground are gathered, and these are allowed to ripen still more on platforms for a month or more before being opened.

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[1] Report of R. R. Barron.

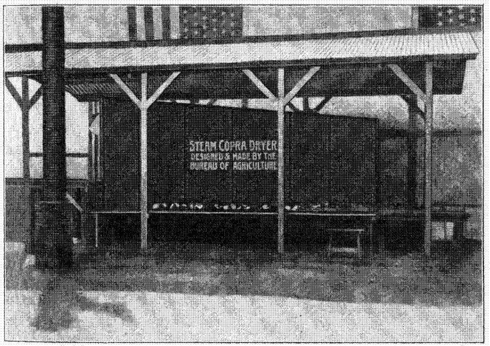
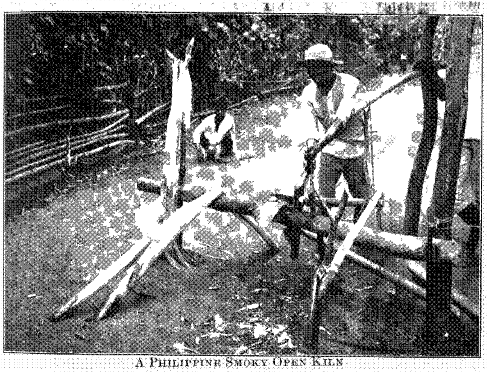


Photo by Bureau of Agriculture

A Model Steam Drier



A Philippine Smoky Open Kiln

CURING COPRA

Perhaps one third of the copra produced in the Philippines is sundried (Cebu copra); the rest is cured by the smoking process known locally as the "tapahan." Both these methods are used in many parts of the world. Sundrying gives a better product, which can be used in the manufacture of foods. On account of the presence of creosote in the smoked copra, this brings a lower price. Expensive refining methods would be necessary to make it suitable for food products, and it is therefore used principally for soaps, candles, and the like. Because of the careless methods employed, both the sundried and the smoked copra get covered with dirt while being cured, and both contain such a high percentage of water that much of the oil is lost through the growth of molds. A better grade of sundried copra would be obtained if it were cured on platforms raised above dust and dirt. A better grade of "tapahan" would result if zinc sheets were placed under the copra while the fresh fuel (husk and shell) is smoking, and until a good body of coals has formed. While creosote would thus be eliminated, the scorching of the product, which is one fault of the system, would not be overcome, however. Ordinary Philippine copra contains from 10 to 15 per cent water when put aboard ship. Copra which will not deteriorate must not contain more than 5 per cent water, and can only be produced in commercial driers in which the moisture is evaporated by hot air or perhaps steam. Such machines are used in Germany, Samoa, French Cochin China, and a few in Java and the Malay states.

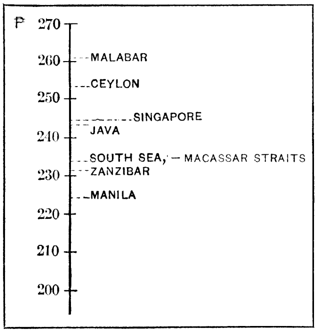


CHART XIII. PRICE OF COPRA IN PESOS PER TON IN LONDON DECEMBER 21, 1911

Statistics from L. Fischel & Co.

At the present time Philippine copra is among the lowest-priced copras in the market. The prices it has brought in comparison with those of other large producing countries can be seen on Chart XIII. As long as the present great demand for copra exists, there will be good profit in the production of the inferior product now exported from the Philippines. Yet to-day over 14 per cent of the possible value of Philippine copra is lost by poor curing (see Chart XIV). Moreover, as the market becomes satisfied, prices are going to drop and the lower grades will be more affected, just as the lower grades of Manila hemp brought proportionally lower prices in the general slump of that staple.

The problem, therefore, is not only to increase the value of the present copra export of the Philippines by producing a clean white copra of low water content, instead of a product which easily molds, but also to anticipate the production of a higher grade of copra in other countries, which will force down the price of a low-grade Philippine product. Such an increase in quality will result from the use of mature nuts and the introduction of artificial driers. The use of ripe nuts may be brought about by educating the coconut growers on this point, or through government regulation.[1] Large driers will

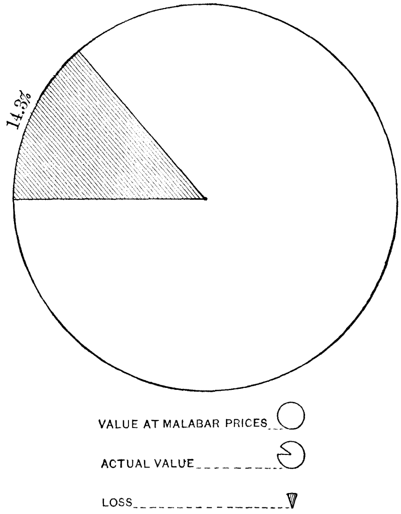


CHART XIV. VALUE OF PHILIPPINE COPRA EXPORTS, 1911

Data from L. Fischel & Co., London

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[1] On the island of Cagayan de Sulu an American trader and planter entered into an agreement with the Chinese traders for the purpose of encouraging the production of better-grade copra. By this agreement the producers have to chop up their copra in the presence of the buyer. If it is shown to be inefficiently cured, made of immature nuts, or smoked, it is not bought. If a Chinaman violates the agreement, he pays a forfeit. As a result the producers use only matured nuts and turn out a good grade of sundried

be secured most readily by the large plantations, although they can be erected by coöperation among smaller growers, or as private central driers to which local growers sell their coconuts.

Such discussion does not take into account improvement in present methods of curing. In many districts the system of buying copra offers no inducement to the maker to produce a better quality, since all grades sell at the same price. Moreover, continued money advances compel the small producers to sell their product to certain dealers. This results in a lack both of competition and of incentive to produce the best copra possible. Were these conditions changed, higher-grade copra might result.

Domestic Consumption

The output of copra in the Philippines depends in no small measure upon the production of tubá. The owners of Visayan groves, particularly those in localities not connected with the market by reasonably cheap transportation, find it more profitable to produce tubá for local consumption than to grow copra for export. To a considerable extent this condition is regulated by the price of copra; for when the price rises, the tendency is to allow flower stalks to yield nuts rather than sap.

The local use of the coconuts themselves is quite large. In several localities, as, for instance, Ilocos Sur and parts of Union Province, the whole crop of nuts is used locally or exported to other provinces for culinary purposes. Coconut oil is the fat which enters to greatest extent into the diet of Filipinos, and it is also employed locally for many other purposes. Since its value in proportion to its bulk is much greater than that of copra, oil is often produced in regions remote from a copra market, since the cost of transporting it is proportionally less. As such regions are tapped by the systems of roads and railroads now being constructed, local oil

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copra, while on all the near-by islands the lowest grade of smoked copra is brought to market (from the report on Sulu district, by H. C. Stanton). The enforcement of very strict government regulation has greatly improved the copra of German Samoa.

production will decrease. In a few localities from which transportation is dear, the product of the coconut palm is reduced to alcohol by distilling the tubá.

The large plantings of new coconut groves are taking hundreds of thousands of nuts which would otherwise be made into copra, and the crop of a few regions near districts in which extensive new plantings are being made is almost entirely sold for seed.

FUTURE OF THE INDUSTRY

In looking to the future of this industry we must first consider the possibility of competition of other oils. At the present time coconut oil is probably more used than any other. Increased demand has greatly increased the price, and consumers will naturally look for cheaper oils to take its place. Of these there are at present only two: the palm oil of Africa, which is not suitable for edible purposes; and the soya-bean oil of China and Japan, which, though cheap and good, is not as suitable for artificial butters and lards as coconut oil. We are therefore safe in stating that at the present time no vegetable oil is known which can compete with coconut oil. The production of synthetic oil is so improbable as hardly to merit consideration. The whole question of the future of the coconut industry can therefore be limited to a discussion of copra and oil. Chart XII shows the increase in the price of Philippine copra since 1899. Whether the high price now obtained for copra will continue, depends on two things: (1) the demand for products of coconut oil; (2) the production of copra. If the two keep pace, the price will continue at its present high point. If the demand increases in greater proportion than the output of copra, the price will rise still higher. If the output increases faster than the demand, the price will fall. Judging from the present uses of coconut oil, and the wider appreciation of its products, the demand is going to increase wonderfully within the next few years, and it is probable that in the immediate future the price will rise. On the other hand, millions of new palms have been planted in the tropics, and soon there will be a big jump in the amount of copra produced, which will probably bring down the price again.

Yet even with greatly increased production it is probable that for many years to come copra will be one of the most profitable crops of the Philippines. New plantations set out by farsighted individuals several years ago are now beginning to bear. Each year finds a larger planting of new palms, and interest in the industry is increasing constantly. With better means of transportation, new areas suitable to the coconut are being made available. At the present time only a fraction of the coconut lands in the Philippines are utilized. Mindanao contains thousands of hectares of such land. The Bondoc peninsula may become as great a coconut grove as the region of Tayabas around Mt. Banahao. Palawan, the highlands of Cavite and Laguna, Sorsogon, Mindoro, Panay, the Sulu Archipelago, and numerous smaller areas offer opportunities for coconut planting. Better methods of cultivating the tree and of making copra are constantly being seen throughout the Islands. Groves in Tayabas which were formerly littered with rubbish and overgrown with underbrush now present clean, straight rows of palms. The tendency to use ripe nuts rather than to cut nuts from the tree is seen here and there. Artificial driers are now being introduced. In many coconut districts there seems to exist a desire to learn better methods.

Europe by the first century A.D., although but few Europeans had at that time ever tasted the substance. The Saracens carried the cane with them in their advance across northern Africa. Through the Saracens, the Venetians became interested in sugar as a commercial product. These two peoples introduced cane culture into Arabia, Egypt, Nubia, Ethiopia, Sicily, and Spain. By the end of the thirteenth century the sugar industry was well known in China and India and in the countries surrounding the Mediterranean Sea. Sugar was not unknown in England, but was still regarded as something of a curiosity.

In the Middle Ages, Venice, then the commercial leader of the world, became the center of the sugar industry. The Venetians carried the sugar trade into England. In 1319 was recorded the first sugar trade in the English market, in which 100,000 pounds of sugar was exchanged for wool. At that time sugar was valued in Scotland at from 75 to 80 centavos per pound.[1] At the present time the price is from 8 to 10 centavos.

Even at this early age the Venetians recognized the possible advantages to be derived from improved methods of production, and rich prizes were offered to stimulate inventive ability. The Venetian inventor of the art of making loaf sugar received a reward of 100,000 crowns. In 1503 the Venetians introduced into Europe the art of refining sugar.

Thus during a period of fifteen hundred years the Indians, Chinese, Saracens, and Venetians each played an important part in the advancement of the sugar industry. The industry then fell into the hands of the rising powers, Spain and Portugal. In 1425 Dom Henry of Portugal sent seed canes to the Canary and Madeira islands. After the discovery of America, Peter Etienza sent cuttings to the island of Santo Domingo, from which cane was carried to Mexico, South America, and northward into the newly opened territory of Louisiana. For three hundred years, however, the Canary and Madeira islands furnished a large part of the sugar supply of Europe.

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[1] "Sugar in Louisiana," *Century Magazine*, Vol. XXXV, November, 1887.

Until the latter part of the sixteenth century sugar was used principally as a medicine. The demand was therefore limited, but was greatly increased by the introduction of coffee in 1575 and tea in 1650. The failure of the mines in the New World had caused a large number of disappointed seekers after wealth to turn to other enterprises, of which sugar production was by far the most attractive. The climate and soil of the West Indies were known to be well adapted to the growing of sugar cane. Indian slaves were used for laborers at first, and later negro slaves were imported. To quote from Bourne, "The development of the sugar industry and the growth of slavery were dependent on each other. Each sugar mill, run by horses or mules, required thirty or forty negroes. Each water mill required at least eighty negroes."

In 1595 a company[1] contracted with the government of Spain for the exclusive right of importing slaves into the Antilles for a period of nine years. They paid the government 900,000 ducats for this monopoly.[2] From 1680 to 1786 over 2,100,000 Africans were imported, largely for use on the plantations. Sugar brought a high price in the European markets, and the trade grew rapidly. The port duties on Haitian sugar alone are said to have built many magnificent buildings in Madrid and Toledo.[3]

The many European wars of the eighteenth century forced Spain and Portugal into the background among the world powers. England became the mistress of the sea and the leader of the commercial world. The control of the sugar supply of Europe passed from Spain to England, where it was destined to remain until Napoleon, the bitter enemy of England, should develop plans which would cause a world-wide distribution of the industry.

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[1] E. G. Bourne's "Spain in America," p. 273.

[2] Ibid.

[3] Freeman and Chandler's "World's Commercial Products," p. 84.

This policy of government aid has produced revolutionary changes in the methods employed, since the government will extend assistance only to those planters who make use of every approved modern device for reducing the cost per kilo of the sugar produced. Formosa has thus acquired an up-to-date system of sugar production without passing through a long and costly period of experimentation and failure. This result has been attained by a careful study of the methods employed in different countries throughout the world, and by selection and adaptation of methods which seemed best suited to the needs of the Formosan planters. In Formosa the old three-roller mills with animal power and the hand ladle for transferring the sucrose have been replaced in one step by the twelve-roller steam mill and the electrically driven pump.

History of Sugar in the Philippines

There are no reliable data concerning the introduction of sugar cane into the Philippines. It has been suggested that certain varieties came from Java, others from Formosa, and that at least one kind came from Tahiti, brought, presumably, by the Spanish.[1] In some sections the primitive implements used in cane culture still bear Chinese names, which suggests that the Chinese had much to do with the establishment of the industry in the Islands.

For three hundred years after the arrival of the Spanish, Philippine sugar was of little commercial importance. Sugar growing was confined to the provinces of Pampanga, Batangas, Cavite, Cebu, Iloilo, and Negros. Finally disturbances in distant sugar-producing areas interfered with the world's supply and created a demand for the Philippine product. During the Crimean War this demand caused local prices to advance to $11 and $12 (Mexican) per picul of 137½ pounds. While this price did not hold for any length of time, it served to draw the attention of sugar brokers to the Philippines as a

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[1] Philippine Census, IV, 26.

Beet Sugar and the Bounty System

This wide distribution came about through the perfection of a process for extracting the sugar content of beets. While the sugar beet had been known to European farmers for over two hundred years, a practical method of extracting the sugar was at that time a comparatively recent discovery[1] and its possibilities were not generally known. The continental sugar supply was greatly reduced as a result of the Berlin Decree (1805) and the Milan Decree (1807), since they caused an English blockade of the European ports under Napoleon's control. Napoleon planned to supply the consumers of continental Europe with sugar from the sugar beet and applied the stimulus necessary to insure its cultivation. By Napoleon's direct orders about 80,000 acres were planted to beets. The price of sugar in European markets was rapidly advancing. The production of sugar from the beet offered an attractive and lucrative occupation to many of the inhabitants of France and the German states, and the beet-sugar industry became quite important in those countries.

The overthrow of Napoleon removed trade restrictions, and consequently the price of sugar declined to a point at which many of the farmers could not profitably raise beets. A few in France persisted, and some Frenchmen continued to manufacture sugar. They were able to compete with cane-growing countries because of their improved methods of cultivation and manufacture. The industry was not important, however, and in 1829 a production of 4000 tons was reported. In 1835 the industry was revived in Germany and after 1840 made a rapid advance. The bounty system was adopted by Germany in 1884,[1] and other countries of continental Europe quickly followed her example.

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[1] In 1590 Oliver des Senes records the introduction of the red beet into Europe; in 1747 Marggraf obtained sugar from beets but at enormous expense; in 1797 Achard invented a simpler method of extracting sugar from beets; in 1805 Baron de Koppy built a factory in Lower Silesia, the annual output of which was to be 525 tons; in 1810 Achard built a factory, producing muscovado at a cost of 1s. 6d. per pound, and white sugar at 1s. 8d. per pound. — Freeman and Chandler, "World's Commercial Products," pp. 103–108.

The plan for encouraging sugar production varied somewhat in different countries, but the essential features were the same. The government placed a heavy tax on manufactured sugar, but if the product was presented for export this tax was returned and in addition a present was given the grower for each ton exported. Under the French law, sugar used at home cost the grower, including the taxes, about ₱0.17¾ per pound. Sugar for export cost from ₱0.076 to ₱0.096 per pound because of the rebate.[2]

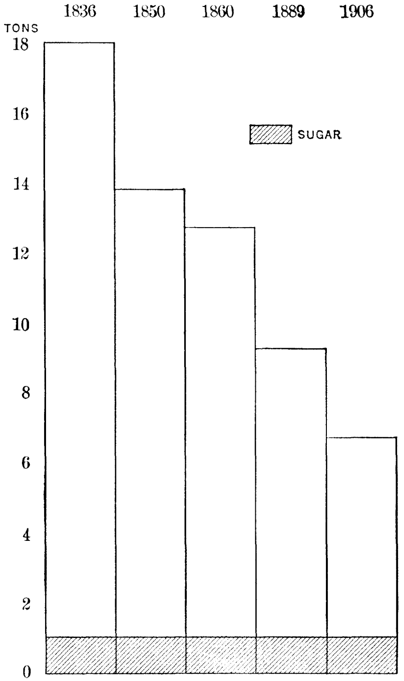

CHART XV. AMOUNT OF SUGAR BEETS NECESSARY TO PRODUCE 1 TON OF SUGAR

Data from *Farmers' Bulletin No. 93*

The results of the bounty system may be briefly stated as follows. The amount of beet sugar exported more than doubled in five years. Of the sugar found in the world's markets at that time about 60 per cent came from the sugar beet. Germany in 1881 produced about 645,000 tons of sugar; in 1885 the yield was 1,150,000 tons. Of still greater importance was the fact that world-wide attention was drawn to the beet-sugar industry, and the aid of experts was enlisted in an effort to lower the cost of production. In about fifty years the yield per ton of sugar from beets was advanced from 5 per cent to 12 or 15 per cent.[1] The use of the diffusion process of extracting the sugar assisted materially in securing this result. Perhaps careful seed selection was of even greater importance.

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[1] Encyclopedia Brittanica, XXII, 625.

[2] Beets producing 7½ per cent of their weight in sugar were taxed 0.05\frac{4}{11}$ per pound. Yields exceeding this and up to 10½ per cent paid half this rate. Yields above the last percentage paid one quarter the tax (French law of 1884).

The bounty system proved of unexpected assistance to the people of England, because the French and German consumers had to pay about 12 centavos more per pound for sugar than their near neighbors, the English. The latter were quick to use this advantage. The English farmers devoted their lands to the production of fruits and berries, and the capitalists erected huge factories for canning fruits and the manufacture of jellies, jams, and candies. It is estimated that these factories furnished employment for over 250,000 people.[2] All continental Europe was forced to purchase its sweets from the English.

Hence the local consumers in continental Europe had cause for complaint. They had to pay ₱0.20 per pound for sugar, while across the Channel in England the same article could be purchased for ₱0.08. The English cane-growing colonies also complained because the bounty-fed sugar had stolen from them the home market.

This state of affairs seemed unnatural in every way and could not be indefinitely continued. After a time public opinion outweighed the influence of the beet growers and the English manufacturers of sugared products. England called a conference at Brussels in 1892. Representatives of all the powers attended. A union of all the important beet-sugar-producing countries was formed, and a plan of action was ratified. It was decided to abolish the bounty system and establish a uniform customs duty of ₱0.10 on raw sugar and ₱0.11 on refined sugar.[1] Russia alone did not consent to this plan, because under the bounty system the Russian sugar industry was developing at an amazing rate. Some countries still levy a duty on Russia's sugar equal to the amount paid by the government to Russian beet growers. In 1907, however, Russia was admitted to the union with the understanding that Russian sugar exports westward were not to exceed 200,000 tons per year. In 1912 arrangements were made for supplementary exports in case of sugar shortage in European markets. The French and German sugar producers do not now receive a bounty because they have reduced beet-sugar production to an economical basis not yet obtained by the majority of the cane-sugar producers. The modern beet-sugar factory is a marvelous example of a productive organization in which waste has been reduced to a negligible factor.[2] It is probable that the continental countries will revert to a modified form of the bounty system if changing conditions should make a bounty a necessity for the beet growers.

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[1] In 1836 it took 18 T. beets for 1 T. sugar.
In 1850 it took 13.8 T. beets for 1 T. sugar.
In 1860 it took 12.7 T. beets for 1 T. sugar.
In 1889 it took 9.25 T. beets for 1 T. sugar.

From 5 per cent of sugar, as found by Marggraf, the sugar beet of good quality has increased to 15 per cent and more, and 12 per cent is considered necessary for profitable manufacture (Mary Hinman Abel, *Bulletin* 93, 1906, Bureau of Agriculture, Washington, D.C.).

[2] *Review of Reviews*, XXVII (February, 1903), 227; *Scientific American* (Supplement), LV, 22, 734.

DECLINE OF THE CANE-SUGAR INDUSTRY

While science, wealth, and statesmanship were uniting to establish securely the beet-sugar industry, a far different state of affairs existed in the West Indies, then the chief source of supply of the sugar from cane. The position of the planters there will be understood after a brief glance at their history in the nineteenth century. During the early part of the eighteenth century England controlled the sugar market of the West Indies. The industry at that time yielded immense profits, because the conditions were favorable. The profits were invested, or squandered, abroad.[1] The planters made little attempt to prepare for periods of depression. In 1834 the English government proclaimed the emancipation of the West Indian slaves. This was a blow to the planters because they understood no labor but slave labor.[2] The measure of self-restraint necessary in dealing with free laborers had never been cultivated by them, and troubles between planters and laborers often arose because of the violence of one or both parties. Moreover, the negroes did not know how to labor as free men. They were careless of their contracts with the planters, and often at a critical period would not labor at all unless paid a large additional sum. Thus they discouraged their employers and destroyed their own means of obtaining a decent livelihood. The government paid about ₱200,000,000 for the slaves. This money was also expended abroad, and when labor and other troubles made ready money a necessity, the planters were almost bankrupt. The usurers supplied the money, but at ruinous rates.

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[1] *Scientific American* (Supplement), LV, 22, 734.

[2] For a description and details of the manufacturing system, see Miller's "Commercial Geography," p. 29; and Nesom and Walker's "Handbook on the Sugar Industry of the Philippine Islands."

Political disturbances were of frequent occurrence in Cuba during this period. Sugar mills were burned and lands laid waste by opposing armies. These losses ruined many planters and disheartened others. The revival of the beet-sugar industry in Central Europe gave a sugar supply greater than the immediate demand, and the West Indian product was crowded out of the market. Because of this condition and of antiquated methods, the planters could not make sugar at a cost to enable them to compete with the energetic, resourceful producers of beet sugar. In the face of a most dangerous rival, the colonial governments and the planters assumed for a time a listlessness which seemed to mean the eventual ruin of the industry. The production decreased at an alarming rate.

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[1] Morris's "History of Colonization," II, 57–58.

[2] Ibid., p. 197.

RESTORATION OF THE CANE-SUGAR INDUSTRY

Early in the twentieth century, however, we find cane growers united in an attempt to reëstablish their product in its old-time position in the world markets. In fact, sugar-cane growers throughout the world are now adapting to local needs many of the devices of the beet-sugar manufacturers. They are also spending fortunes in experimenting with new processes looking toward the elimination of waste in every form. Java, Cuba, and Hawaii are the leaders in the restoration of the cane-sugar industry.

Java long prospered during the period of its forced-labor system. Even during that period the sugar industry was regarded at times as "an intolerable burden."[1] The change[2] to free labor began in 1870 and was completed in 1890. Because of ignorance and mismanagement many of the factories were run for years at a loss. As a rule the Javanese are slow to adopt new methods, but a marked change of policy has been apparent in recent years. Their sugar estates are large, and mills of the latest model are being installed. At present there are nearly 200 mills in the island. They now export over 750,000 tons a year to India, China, and Japan, and may increase the amount to 1,500,000 tons. As a result[3] of the Spanish-American War much of the Philippine sugar formerly sent to China is exported to America, and Hongkong importers are supplying the deficiency by purchasing annually from Java a constantly increasing amount.[4]

Prior to 1887 the best Cuban mills extracted 63 per cent of the juice of the cane. Recently mills have been installed which exert a pressure on the cane of 500 tons per square inch, extracting 95 per cent of the juice and leaving the bagasse practically dry. In 1909 one Cuban company threw out comparatively new machinery costing nearly a quarter of a million dollars in order to install the newest model. The same company operates 50 miles of railroad extending through their fields. The cane is not touched by the laborers' hands from the time it is placed on the freight car in the field until the ash of the bagasse is removed from beneath the furnace. It is thus evident that a modern cane-sugar mill is an expensive affair. The fact that new estates are being opened up in Cuba, and that the cultivated area of the older estates is being enlarged, would indicate that the industry promises satisfactory profits.

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[1] *Annual Report of the Governor General of Java*, 1834.

[2] Day's "The Dutch in Java," p. 393.

[3] The *Louisiana Planter and Sugar Manufacturer*, August 6, 1910.

[4] The *International Sugar Journal*, XIII, 147.

Hawaii is probably the most prosperous of the three leading sugar-producing countries. Her planters have keen business ability combined with energy and forethought. Where conditions have been unfavorable they have procured the necessary changes. They unite to expend vast sums on experiments. They employ the most economical methods of growing, handling, and working up the cane. As examples may be cited a recently perfected process for the rapid clarification of sugar and a new system of recovering the sugar formerly wasted in the molasses.[1] On many estates the canes are floated to the mills in flumes of running water, which may also be used to irrigate the fields. The cost of production in Hawaii is said to be lower than in Java or Cuba. Hawaiian sugar enters the United States duty free, a privilege worth about $3,000,000 a year to the Hawaiian planters.

The sugar mills of Formosa are of interest to the people of the Philippines, since the Formosan planters are their nearest and most favored competitors. The sugar industry was an important one in Formosa long before the days of Koxinga. Koxinga, the Dutch, and the Chinese all gave it some encouragement. In 1902 the Japanese government enacted laws very favorable to cane culture, which included the lease of government land, rent free, financial aid to enterprises employing the most modern methods of culture and manufacture, and modern sugar mills erected and loaned to the planters.

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[1] *Far Eastern Review* (December 1911), Vol. VIII, No. 7.

eighteen provinces, with the island of Negros far in the lead. Conditions in Negros at this time were ideal. It had cheap labor, plenty of work animals, and, when necessary, American and English firms supplied the working capital. The methods, however, were primitive and wasteful.

In 1897 there were in the Archipelago 3000 plantations, each with a small mill. In Luzon the share system was popular. The landowner not only leased to the tenant as much land as he individually could care for, but also provided carabaos, wooden plows, and other farming implements. The tenant received from one third to one half of the sugar, but the cost of crushing the cane and making the sugar was deducted from his share.[1] In the southern islands the laborer received a stipulated wage per day, usually from ₱0.20 to ₱0.50. Many children found employment in the cane fields.

PERSISTENCE OF ANTIQUATED PHILIPPINE METHODS

Since 1897 the sugar industry has not been profitable. All productive work was demoralized during the political disturbances of 1895–1899, and we have little reliable data covering that period. In 1901 the exports were only one third of those of ten years before, and the renewed activity shown in other lines of work is not found in the same degree in the sugar industry. The reason for this is plain. While the planters in other countries have been reducing the cost of production, usually by increasing the number of tons per acre obtained from the original expenditure, the planter in the Philippines has faced a gradually increasing cost per ton of sugar. To-day the cost for the average farmer is nearly double that of twenty years ago, while the price in the world markets is held fairly steady by the competition between the cane- and beet-sugar interests.[2]

China and Japan with a small shipment to the continent of Europe (Census of the Philippine Islands, IV, 30).

[1] Foreman's "History of the Philippines," p. 313.

[2] The Philippine Census, 1903, IV, 32.

possible source of supply. The opening of the Suez Canal in 1869 also increased the importance of the Philippine sugar fields, since it brought Manila within less than 10,000 miles of Liverpool. The general effect on the sugar industry may be seen in Chart XVI.

In 1877 a British firm established a sugar central at Mandaluyon on the Pasig, about three miles from Manila. The plan was to pump the cane juice from neighboring mills to the central through pipes. A fleet of schooners equipped with tanks was to bring the juice from the more distant mills. It was hoped to extend this service as far as the Visayan Islands. The mill was unprofitable and was closed in 1880.[1]

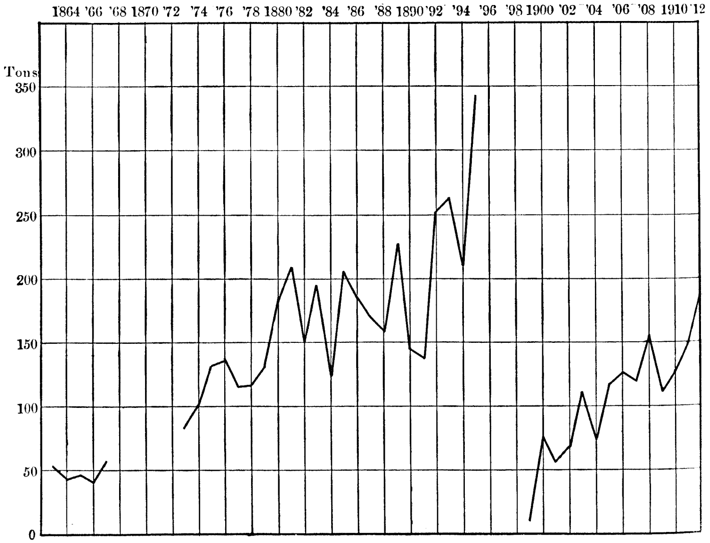

CHART XVI. PHILIPPINE SUGAR EXPORTS; QUANTITY IN THOUSANDS OF TONS

Census and Customs Statistics

In 1893 the total production of sugar was 300,000 tons, of which 261,686 tons were exported.[2] The supply came from his small share of effort, spoils it before it reaches the channels of trade.

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[1] Foreman's "The Philippine Islands," old edition, p. 312.

[2] In 1893 the United States and Canada took about 30 per cent of the exports, Great Britain 37 per cent, and the balance was divided between

Most of the tobacco raised by the small growers reaches the factory agents or large dealers through buyers. Some of these men buy all classes of tobacco regardless of its quality, and, in certain localities, the fixed rate paid for all leaf during the monopoly still persists. Just as in the abaca trade, the producer, not receiving a correspondingly high price for better grades of tobacco, is given no incentive to produce other than the low quality. There is no need of his expending effort to produce a high grade of tobacco when with less labor he can make as much money from a low grade. Even when the grower sells by quality, the buyers classify the leaf as low as possible, reclassifying it higher when they sell it.

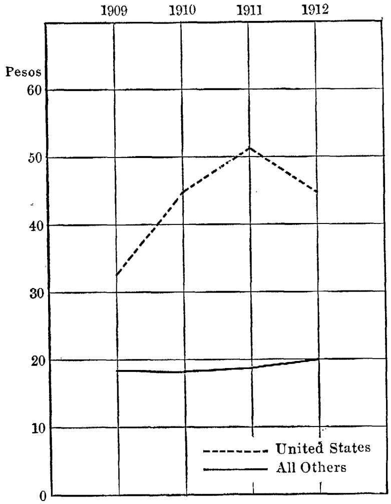

CHART XXV. PHILIPPINE CIGAR EXPORT; PRICE PER THOUSAND

Customs Statistics

The pernicious system of advances which applies to all Philippine industries is particularly in evidence in the Cagayan Valley. The ignorant planters are at the mercy of the small buyers, who lend them money on growing crops at exorbitant rates of interest, compelling them to hand over their product at an exceedingly low price.

Hence it is that the ignorance of the small farmers in the Cagayan Valley results, first, in the production of a tobacco of much lower grade than should be grown in that region; and, second, in the farmers being imposed upon by dealers and kept in a state of poverty with no incentive to improve either their product or their lot.

The fluctuations, decline, and rise in the price of Philippine sugar may be seen on Chart XVII. From 1877 to 1895 the downward tendency may be explained by the presence in the world's markets of a constantly increasing quantity of beet sugar.

Many reasons for the increased cost of sugar production have been given. Among those mentioned are the increasing cost of labor and work animals, the necessity for borrowing money, and the losses due to drought and locusts. More weighty than any of these is the fact that the planters who complain of the increased cost of production are trying to use in modern times and under modern conditions the methods and machinery that were successful during the earlier days of the cane-sugar industry. For example, in 1911 sixty-four mills were employed to grind the cane from 2000 hectares in Central Luzon. Thirty-four of these mills were run by carabaos; the rest were small

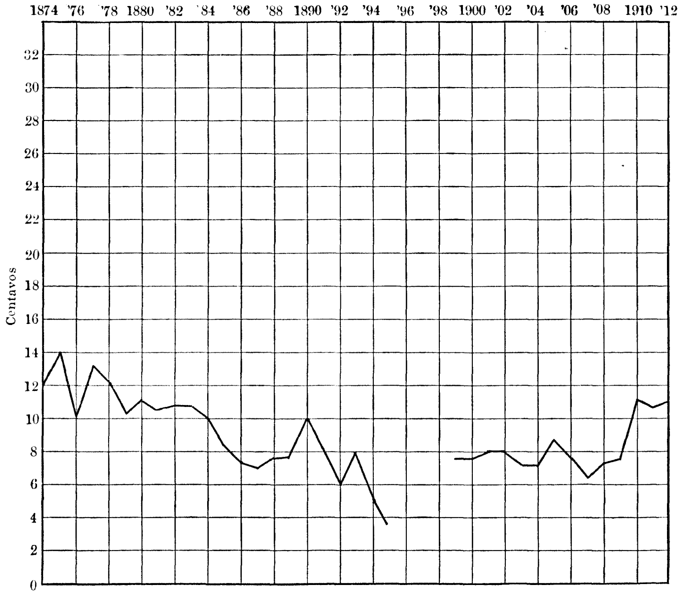

CHART XVII. PHILIPPINE SUGAR EXPORTS, PRICE PER KILO

Census and Customs Statistics

steam mills. The former obtained about 50 per cent of the cane juice and the latter from 60 to 65 per cent. The product if exported must compete with that from mills extracting at least 95 per cent of the juice.[1]

The district mentioned is fairly typical of many of the cane-planted areas of the Islands. In a section of Iloilo Province the proportion of animal-power machines is a little larger while the number of hectares per mill is about the same.[2] All the sugar from these mills is of a low grade, but the cane as a rule is grown on high-grade sugar lands.

From the foregoing pages it is evident that while the Philippines had modern sugar machinery fifty years ago, or about the time of the Crimean War, for various reasons our planters have not progressed as rapidly as other producers in the cane-growing tropics. The gulf between them has been widening rapidly during the past fifteen years. A revolution in methods similar to that which is taking place in Formosa is needed to place these Islands permanently among the sugar-producing regions of world-wide importance. The first steps in that revolutionary change are being taken at the present time.

Introduction of Modern Methods in the Philippines

It is true that planters are often at a loss for labor, but this is not necessarily the fault of the laborer. The great industrial awakening of the last ten years has created something of a rivalry between different classes of enterprises. Land and capital have been obtainable, and there is a brisk bidding for labor. This is notably true for the sugar, abaca, and copra industries. Labor is not sold to the sugar grower when other industrial promoters will pay more than he does. Filipino laborers do not object to working in the sugar fields, and many of them have gone to the sugar plantations of Hawaii. The spirit of adventure may account in part for this movement.

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[1] Economic reports by James H. Bass, Pampanga.

[2] Economic reports by William E. Mack, Iloilo.

The fact remains that the planters of Hawaii are paying about twice as much wages as the planters in the Philippines pay, and are content to do so since they secure the labor that they need. This being true, the Philippine planter must give a larger proportion of his receipts to the laborers. It is believed that this higher labor cost can eventually be offset by more efficient agricultural machinery, more economical methods of transportation, and better management of the land.

Time, labor, and money are three important factors in remodeling the methods of producing a commodity. The amount of each necessary to bring about required changes in the domestic sugar industry will depend to a considerable extent on the measure of coöperation effected by the Filipino people,[1] and this in turn will depend on their realization of the needs and the best methods of attaining these needs. It is evident that the Philippine government is not at present in a position to extend to its planters as much direct help as has been given the Formosan planter. Nor is such help needed, as is shown by the progress already made.

In the region of Ma-ao and Bago, Occidental Negros, both Filipino and Spanish firms are introducing modern machinery because they believe that it pays.[2] That the example of these progressive men will be followed by others in their neighborhood cannot be doubted. In San Carlos, Occidental Negros, the plan of milling on a mutual-contract basis is being given a thorough test. By this plan mill owners will grow little or no cane, but will grind for neighboring planters, taking in payment less sugar than is now wasted in the bagasse.[3]

Mills in Calamba, south of Manila, and Dinalupijan, Western Pampanga, are demonstrating to cane growers of their respective sections the value of a modern equipment. Throughout Mindoro farmers have had the custom of planting to cane

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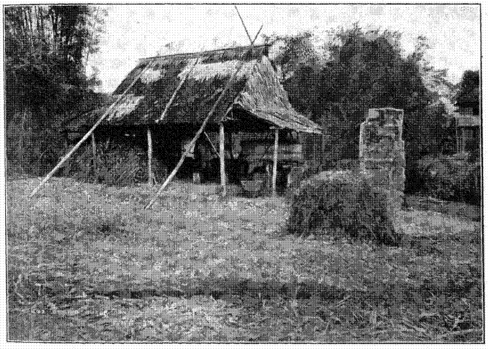
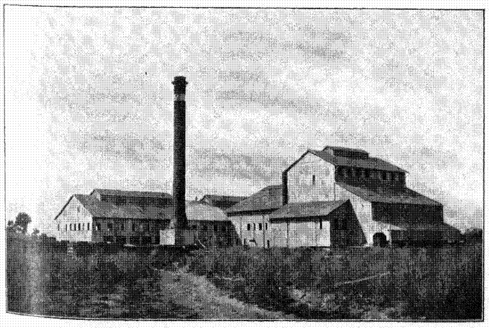
[1] Newsom and Walker's "Handbook on the Sugar Industry of the Philippine Islands," p. 17.

[2] Economic report by C. O. Harbaugh, Occidental Negros.

[3] *Cablenews-American*, October 2, 1912.



An Antiquated Boiling Plant



A Modern Central on Mindoro

PHILIPPINE SUGAR MILLS

a small area for domestic use only.[1] Certain sections of the island of Mindoro, however, have been transformed into sugar-producing regions of importance by the mill now in operation on the San José estate. It seems very probable that the example of this milling company will be followed later, and on a limited scale, by trained employees of the company. Thus in each important section where sugar is now grown there are modern plants operated by keen, farsighted business men. There can be little doubt that the influence of these plants, as practical demonstrators of new methods, will be felt throughout a constantly widening circle.

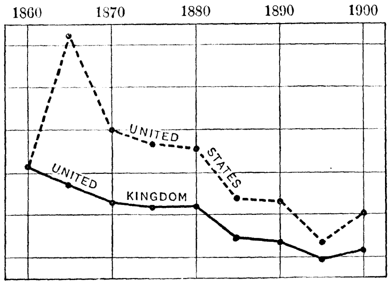


CHART XVIII. WORLD'S SUGAR PRICES

After Bartholomew

MARKETS FOR PHILIPPINE SUGAR

Very early in the history of the Philippine sugar industry, England and the United States appeared as the most acceptable purchasers. The opening of the Suez Canal was an important factor in the development of the trade with the former. The European buyers, however, did not greatly care for our sugar because of its low grade and the consequent high cost of refining it. With the appearance in European markets of large quantities of high-grade beet sugar, Philippine sugar was crowded out, and exporters sought in China and Japan markets which could not purchase beet sugar because of the cost of transportation. Japanese markets are of little importance to the Philippines just now because of the rapid development of the sugar fields of Formosa. The measure of free admission to American markets provided by the passage of the Payne Bill in 1909, however, has given more than full compensation for all losses in the Orient. In fact our sugar exporters have voluntarily reduced their exports to Hongkong as well as those to Japan. This is because the tariff-protected markets[1] of America offer a higher price and must continue to do so as long as the United States spends ₱200,000,000 a year for foreign sugar (see Chart XIX). In Chart XIX is shown the relative exports to China and the United States before the passage of the Payne Tariff Bill and the subsequent rapid development of the American market and decline of exports to China.

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[1] Economic report by Luther W. Cureton, Mindoro.

A careful study of the Formosan sugar fields suggests that they cannot produce more than three fifths of the sugar demanded by the Japanese consumers. The present sugar consumption in Japan is twelve pounds per capita. This seems destined to increase more rapidly than the population of that country,[2] because of many influences

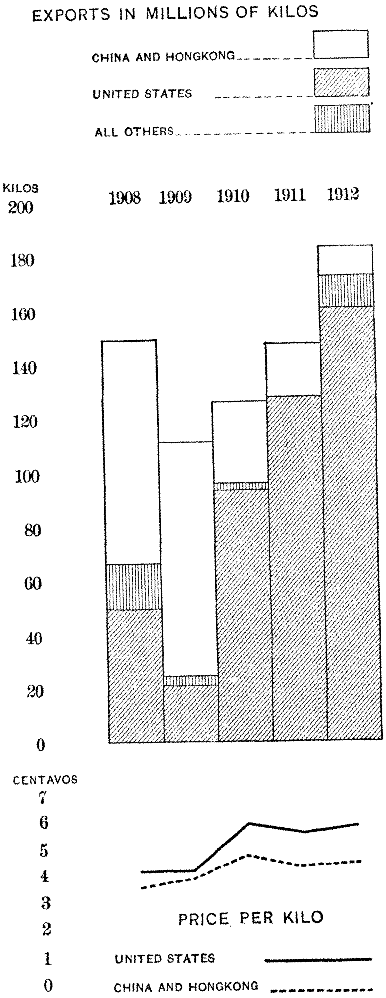

CHART XIX. PHILIPPINE SUGAR EXPORTS

Customs Statistics

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[1] In 1912 the American tariff on sugar of 96° test was about ₱65.488 per long ton.

[2] Y. Takekoshi's "The Japanese in Formosa," p. 242.

looking toward an improved standard of living. A similar result should appear in China in the near future for the same reason. If the Chinese should use as much sugar per capita as is used by the United States, the Chinese markets would absorb practically the whole of the present sugar production of the world.[1] In estimating markets, however, we have to remember the possible development of beet-sugar interests in Korea and Manchuria, and the expansion of beet culture already well organized in southern Australia. Sugar entering any of these countries must be prepared to compete with the local product. The United States is to-day the most valuable customer of the Islands, and it is hardly possible that the full development of the cane fields of Hawaii, Cuba, Porto Rico, and the Philippine Islands will meet the demands of the sugar consumers in that country.

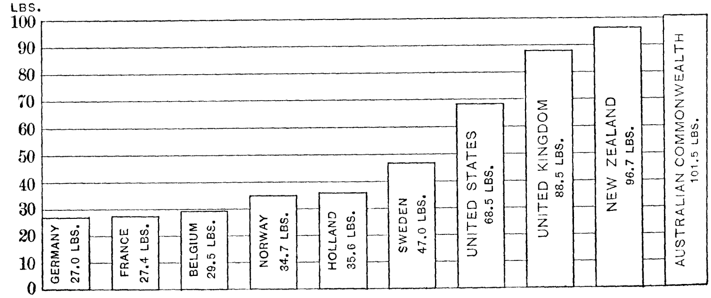

CHART XX. PER CAPITA CONSUMPTION OF SUGAR 1903

After Bartholomew

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[1] Lecture by Walter E. Gonder, Bureau of Science, Manila, P. I.

CHAPTER VIII

EXPORT CROPS — TOBACCO

Markets for Philippine Tobacco

The present markets for Philippine tobacco are three in number and are indicated on Chart XXI. There is a large domestic consumption of locally grown leaf and of cigarettes made in Manila. There is also a considerable export of cheap leaf to Europe, the source of much of which is the Visayas. Since the enactment of the Payne Bill a large market for good and high-grade Philippine cigars has been opened in the United States. The amount of tobacco consumed in these, though relatively small, is of high grade and value. Under the present law the number of cigars which can be exported from the Philippines into the United States free of duty is limited to 150,000,000 per year, but the present export does not approach this number, nor is it likely that it will equal it for several years to come. In 1910, immediately after the Payne tariff went into effect, there was a large export to the United States of Philippine cigars, many of which were of inferior grade. This tended to give Philippine cigars a bad name in the United States market, and exports fell sharply in 1911. Since that time there has been a more careful development

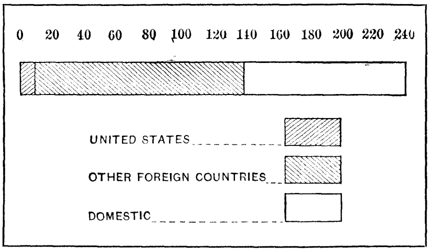

CHART XXI. CONSUMPTION OF PHILIPPINE TOBACCO IN THOUSANDS OF TONS

Internal Revenue Statistics

of this market, and export of "Manila cigars" to the United States is now steadily increasing (see Charts XXI and XXII). With the full number of existing cigar makers at work only about 75,000,000 cigars could be furnished this new market, if the Manila factories were to meet the demand from Europe, Australasia, and Asia. The cigar trade with the United States is so much more remunerative, however, that manufacturers will supply it as far as the amount of high-grade leaf available and the number of cigar makers will permit. The number of cigar makers is increasing slowly, and it may therefore be expected that the general Philippine cigar export trade will expand gradually, and that increase in cigar exports to the United States will result in a decrease of exports to other countries.

The domestic consumption of Philippine tobacco and the export of the inferior leaf to Europe needs no particular discussion. The Philippine tobacco problem is to produce a sufficient quantity of higher-grade leaf for increasing demand for Philippine cigars in the United States, and to increase the number of cigar makers in Manila.[1]

HISTORY OF PHILIPPINE TOBACCO

Tobacco was introduced into the Philippines from Mexico at an early date, and in 1759 was already grown on the island of Cebu. It received its first impetus, however, from the tobacco monopoly which was established in 1782. From the beginning of its use in commercial quantities tobacco has been particularly subject to government monopoly and regulation for revenue. To-day France, Italy, Japan, and Turkey have government tobacco monopolies which regulate growing, manufacture, and sale. In other countries, as the United States, tobacco is subject to high internal revenue taxes. The chief purpose of the tobacco monopoly in the Philippines[1] was to get revenue. Previous to this time the colonial government had not been able to raise enough money by taxation to meet its expenses. Systematic opposition to all extensive agricultural enterprises arising from private initiative had developed, and agricultural and industrial progress had been slow. Moreover, the high profits of the trade centering at Acapulco, Mexico, drew attention away from the surer but smaller income from agriculture. But since the Acapulco ship came but once a year, the total profits from this trade were much less than the profits from agriculture and manufacture would have been, had the energies of the wealthy only been directed to them. Therefore the wealth of the country remained so small that it was impossible to raise much by taxation, and Mexico each year sent money to help run the government of the Philippines.

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[1] The question of increase in number of skilled workers is considered in Chapter III. It has been proposed to establish schools for instruction in cigar making.

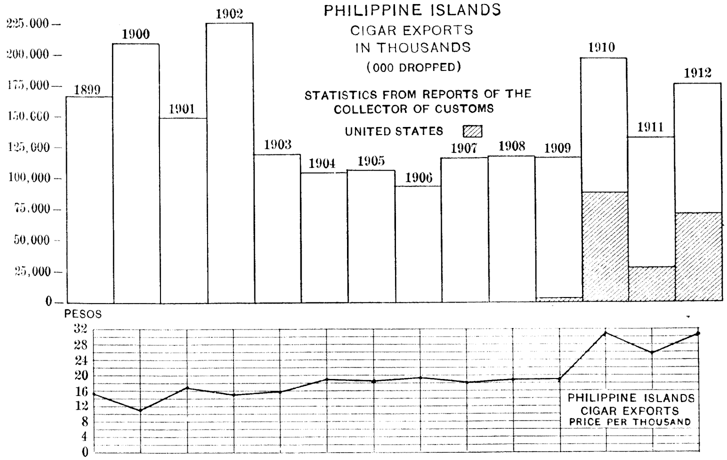

CHART XXII

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[1] Most of the information on the tobacco monopoly presented in this chapter is taken from a report made to the Director of Education on this subject by Mr. David W. Lucas of the Philippine School of Commerce. This information was obtained from Blair and Robertson, *Bulletin No. 58* of the Bureau of Labor, Washington, D.C., and the report of United States Consul Webb of Manila in "House Miscellaneous Documents," 1889–1890.

In 1782 Governor Basco y Vargas, by authority of a royal order, established the tobacco monopoly. It was managed directly by the government and limited the cultivation of tobacco to certain districts — at first Gapan in Nueva Ecija Province, some municipalities in Bulacan and Cagayan, and the island of Marinduque; later the area which might be cultivated was increased. In the most fertile sections nothing but tobacco could be grown. The government determined the amount which any man could cultivate and bought the whole crop at a fixed price, selling it again at a good profit.

As a revenue measure the monopoly was highly successful. Not only did the subsidies from Mexico become unnecessary, but money was actually sent back to Spain as a balance for sums previously sent over by Mexico. One writer said that it could become a greater source of revenue than all the others of the colony. By 1882, when the monopoly was abolished, its gross annual revenues were about four million pesos.

The tobacco monopoly was finally abandoned, however, on account of the evils which were connected with it. From the first, graft existed; some tobacco escaped the officers. The hill tribes in their bamboo fortresses raised tobacco and smuggled it down to the lowlanders. Agents of the government bought the tobacco from the planter, turned it over to the government at a higher grade, and pocketed the difference. But these were lesser evils. The greatest wrong was in buying the tobacco at too low a price and paying for it in promises. Seven years after the abolition of the monopoly the price paid the planter had increased 100 per cent, which shows that the grower had been paying an unjust proportion of the government revenues. The effect of the monopoly was to make him pay 50 per cent of his gross income as a tax. At first the grower was paid for his product at once, but afterwards scrip was issued payable at the option of the government. For a while these promises were redeemed promptly, but later payment was deferred until the value had decreased by a third. Many times the planter, needing his money at once, sold the scrip to speculators for as little as 10 per cent of its face value, thereby getting just one twentieth as much as he did seven years after the abolition of the monopoly.

While the chief aim of the tobacco monopoly was to secure revenue, it also resulted in the production of a higher grade of tobacco. This was accomplished by close supervision. Each province was divided into inspection districts in charge of a head officer, under whom were the gobernadorcillos and tenientes. The total amount of tobacco to be raised was determined in Manila, also the kind, color, and grade. The governor of each province received orders from Manila and apportioned to each inspection district its share of tobacco to be grown, and then each municipality and barrio was allotted its share. The inspector rode over his district looking after the tobacco, and destroyed any not up to specifications. In this manner a more carefully cultivated and cured crop resulted than has since been marketed.

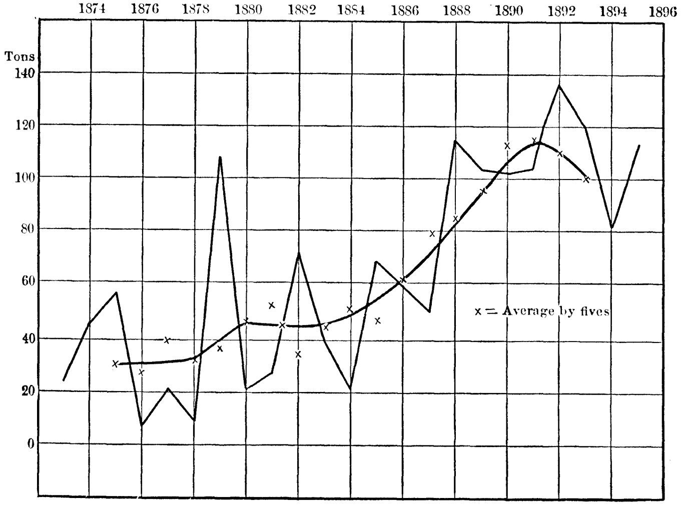

CHART XXIII. TOTAL PHILIPPINE TOBACCO EXPORT, 1873-1895. QUANTITY IN THOUSANDS OF TONS

Census Statistics

FACTORS WHICH REDUCE QUALITY

During the life of the tobacco monopoly the industry had been principally established in the Cagayan Valley. When the tobacco growers were freed from restraint, there was a great increase in the amount of tobacco raised throughout the Islands. Most of it was consumed locally, while some of it made up the increased exports noted on Chart XXIII. However, the Cagayan Valley has remained the chief tobacco region in the Philippines on account of its favorable soil and climate.

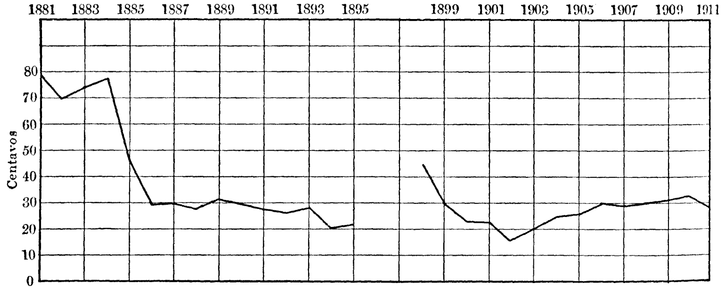

CHART XXIV. PHILIPPINE LEAF TOBACCO; EXPORT PRICE PER KILO

Census and Customs Statistics

The grade of tobacco now produced in this valley is very low in comparison with the quality which could be raised. One of the chief causes for this low-grade production is the lack of supervision over the small growers, who produce the bulk of the tobacco and who are very ignorant of the proper methods of culture and curing. There are only four or five large plantations in the Cagayan Valley, and it is estimated that 90 per cent of the tobacco grown there is raised on 20,000 small plantations, averaging an acre each.[1] The problem is to instruct or supervise these small growers so that the naturally excellent leaf will be turned into good tobacco. Nature now grows a good tobacco there, but man, begrudging

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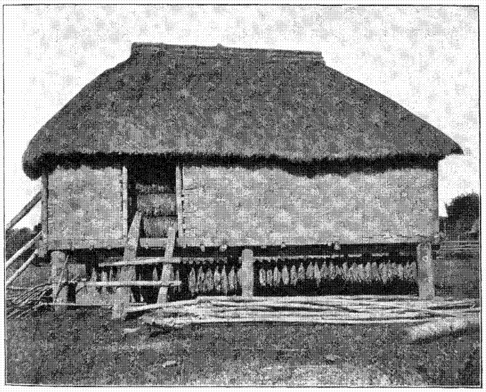
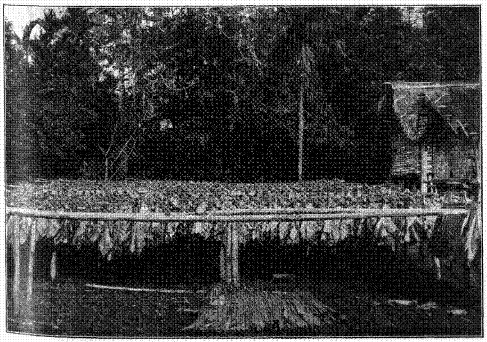
[1] John S. Hord, in the *Agricultural Review*, Manila, Vol. III, No. 4, p. 222.



Curing under a House



Drying in the Sun

REDUCING THE GRADE OF PHILIPPINE TOBACCO

The poor methods which result in low-grade tobacco begin with the seed beds,[1] which are seldom well located and are neither properly planted nor cultivated. The fields are poorly tilled, and the farmer usually delays transplanting until the last minute. The cultivation is carelessly done. An immense amount of leaf is lost by worms. This negligence in cultivation alone probably reduces the tobacco crop of the Cagayan Valley by one half. About two thirds of the crop produced is gathered when too green or too ripe, the remaining third being harvested at the proper time. The process of curing tobacco in this section is without doubt the worst that ever existed in any tobacco-producing country in the world.[2]

Plans to effect Improvement in Quality

The excellent quality of Cagayan leaf is therefore not the result of careful cultivation and curing, but persists in spite of the slack methods by which it is produced. The great market for Philippine tobacco is that for cigars in the United States, and this demands a high-grade leaf. To bring about the production of such a leaf is a complicated matter, however, involving as it does some change in the system by which the small dealers now sell their tobacco, so that there will be an incentive for the production of a higher-grade product. Even under the strict rules of the tobacco monopoly it was impossible to counteract entirely the effect of the indolence and carelessness of the growers. They would not strive for superior excellence in cultivation, nor could they be made to understand the importance of attention to the details in curing.[3] Moreover the tobacco monopoly was a failure because of its abuses, and furnishes an example of what may result from absolute control of large productive enterprises by the

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[1] See Miller's "Commercial Geography," for details of correct planting, cultivating, and curing tobacco.

[2] The discussion of tobacco culture in Cagayan is taken from an unpublished report by Boltos Brewer made to the Director of Education.

[3] *Bulletin No. 58*, Bureau of Labor, Washington, D.C.

The Central Plain of Luzon (the granary of the Philippines), the Plain of Leyte, the Central Plain of Panay, and the Cotabato Plain contain the largest continuous stretches of agricultural land in the Philippines. The soil brought down from the surrounding mountains often covers these plains to a considerable depth. In the Central Plain of Luzon and in the Cotabato Plain, rivers offer cheap transportation, and road and railroad building is not difficult. Hence it is that the plains, so far as political conditions will permit, are among the richest and most densely populated regions in the Philippines. They are also the regions which offer greatest opportunity for agricultural expansion in the future.

Of Philippine valleys, the Cagayan and Agusan are the most important, though many other small valleys, such as the Bicol and the Gandara, are very fertile. The population of the Philippines has not been dense enough to occupy more than the flood plains of these valleys. The great grassy stretches extending on either side are very fertile, but are harder to bring into and keep in cultivation than are the flood plains which annually receive sediment from overflows. In the Cagayan Valley the floods deposit from 1 millimeter to 25 millimeters of sediment on the flood plain each year. It is largely on account of the fertility thus added that tobacco of such good quality is continuously raised there. The rivers of these large valleys offer facilities for transportation, but the swift current which often characterizes them lessens their value for this purpose. The valleys are subject to more destructive floods than are the plains, though it is probable that the increased fertility developed by the deposits of silt more than compensates for the actual damage wrought.

Throughout the Philippines there are numerous small valleys in the mountains or opening out into the coastal plains. In these some of the richest land for small farming is found, but the difficulty in transporting produce from them is usually so great that they are but sparsely settled. Many of them are not occupied at all.

government. Hence any plan for improvement in the quality of Cagayan tobacco, which is based upon government control, must be considered a more or less dangerous one. It has been proposed to limit the amount of land cultivated and the number of plants grown by each farmer, and to supervise various steps in the cultivation, harvesting, and curing of the tobacco by a system of government experts holding authority to destroy tobacco not up to standard. If carefully carried out, this plan might be a success, but its dangers are many.

At the present time government efforts to improve the quality of tobacco in the Cagayan Valley have been along the line of instruction and example, and considering the difficulty of the situation some little success has been attained. Experts travel over the tobacco section, studying conditions, giving advice, and using their influence to introduce better methods. Seed cleaners are stationed in numerous localities, so that the farmers are able to obtain better tobacco seed, which means a superior product. Experiment stations are also included in this plan. Even schools have taken up the subject; oral instruction is given in the classroom, and school plots are cultivated under the direction of the teachers.

If the selling of ungraded tobacco could be absolutely stopped and a system of sale by grades substituted, it is probable that output of better quality of leaf would be brought about much more rapidly. The only direct control which the government now exercises over the tobacco industry in the Cagayan Valley is in requiring the leaf to be smoothed before sale, and the bale to be made according to certain specifications as regards weight and manner of packing.

Of the two possible remedies, government regulation and education, it is probable that the latter will bring about results more slowly, but that they will be more extensive and more permanent. Such results will also be consummated with less friction and with less danger of abuse.

CHAPTER IX

MINOR AND POSSIBLE EXPORT CROPS

Abaca, copra, sugar, and tobacco composed 94.8 per cent of the exports of the Philippine Islands in 1912. In this chapter we shall consider certain minor agricultural exports and certain other crops which, though grown but little in the Islands, could be produced in much larger quantities.

AGAVE FIBERS

Henequen[1] fiber has been known and used in Mexico for centuries. In 1783 its value for cordage was recognized, and in 1830 a small quantity was shipped to Europe. However, large production and export of that fiber occurred only when machinery had been invented which could strip the fiber from the leaves at small cost. The machine used for this purpose was invented as a result of a prize offered by the Mexican government. The low cost of obtaining the fiber then made it possible for henequen to compete successfully with other rope fibers, and caused large plantations to be started in Mexico. Various tropical and subtropical countries later established plantations with several species of agave, so that the amount of agave fiber now produced is very large. Improved machines and increased production have brought down the price so that it is now profitable to grow agave only on large plantations where systematic cultivation, stripping, and marketing make it possible to eliminate all waste. The day has passed when the small planter and stripper of agave fibers can make money.

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[1] The identity of the plants from which agave fibers are obtained has now been determined as follows:

sisal = *Agave sisalana* Perrinne;
henequen = *Agave fourcroydes* Lemaire;
maguey = *Agave cantala* Rox.

Agave cantala, the species from which maguey fiber is obtained, was probably introduced into the Philippine Islands from Mexico, and is now found growing throughout the Archipelago. The fact that it can be raised upon poor soils, such as those found in Ilocos Norte, Cebu, Bohol, and other regions, caused large numbers of these plants to be set out several years ago when the price of agave fibers was comparatively high. In the meantime, however, the large sisal plantations in German East Africa and other countries came into bearing, and the price of these fibers has fallen. The scattered plantings of maguey in the Philippines do not warrant the use of stripping machines, since a continuous supply of leaves cannot be obtained and transportation from scattered localities is expensive. In Java it has been proved that successful plantations must be well equipped with machinery and must consist of about 300 hectares with *cantala* as the chief crop, or 125 hectares with *cantala* as the secondary crop.[1] Since no plantings of maguey in the Philippines approach this size, it is evident that the commercial production of maguey here is not profitable. Indeed in most parts of the Islands either the maguey leaves are allowed to go to waste or the plants are grubbed up. The annual export, valued at about ₱500,000, comes chiefly from Ilocos Norte and Cebu and is obtained by retting. The workers usually own the leaves and get from the sale of the fiber the equivalent of only a fair wage. In view of the much higher returns from other crops raised in the Philippines, it is not probable that interest in maguey will soon be revived. However, the introduction of suitable machinery and the establishment of large and systematic plantings, or of small but sufficiently concentrated ones, would develop the maguey industry to the extent to which the sisal industry of East Africa has been developed. Indeed, in as much as maguey is a better fiber, it might prove more profitable in large plantations than sisal has proved in East Africa.

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[1] *Bulletin of the Imperial Institute*, London, Vol. X, No. 2, p. 301.

KAPOK

Kapok trees grow throughout the Philippines, here and there along roads. If the fiber from these trees were gathered, the aggregate amount would be considerable, but with the exception of Oriental Negros, few of the provinces produce the fiber in commercial quantities. Java is the chief source of the kapok used in Europe and the United States.[1] Much of the Java fiber is obtained from trees planted along the roads, but regular kapok plantations also exist. The price of kapok in the world's market has been increasing, as can be seen from the chart, which shows the maximum prices in the United States. The amount of kapok exported from the Philippines is almost negligible in comparison with that from Java. In 1909 Java exported over 8000 tons of kapok. In 1910 the

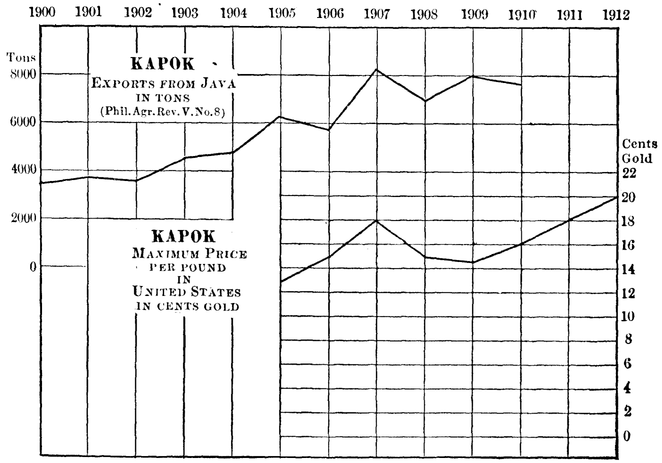

CHART XXVI

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[1] The growth of this industry can be seen on Chart XXVI.

Philippines exported 30 tons, and 98 tons in 1911. However, interest in kapok is awakening here, as is shown by the fact that the export of this product has been brought about since 1905. Most of the fiber has been obtained from Oriental Negros, but certain other provinces are also becoming interested. If the pods from the kapok trees now existing in the Philippines were gathered, the present export could be increased many times without decreasing the amount used locally. The present demand and outlook warrants the planting of more trees along the roads and about houses, and the establishment of plantations.

FRUITS

The position of fruits in the diet of the Filipinos has already been explained. The fact that the local demand for fruits is not satisfied would of course preclude export to foreign countries. There is only one considerable area in the Philippines which at the present time is economically dependent upon fruit culture, and this is the orange district of Tanauan in Batangas Province. Yet there are several fruits in the Philippines which could, either in their present variety or in an improved type, be produced in large quantities for both local use and export. With respect to foreign fruit markets two methods of disposing of the product may be considered — the export of canned fruit and the export of fresh fruit.

A good example of the former method is the pineapple-canning industry of the Hawaiian Islands, where a very large amount of capital is invested in canneries. The plantations on which the fruit is produced are extensive, and a large number of laborers are employed. Exports of fresh fruit require a market fairly close at hand. Some fruits, such as bananas, can be carried long distances if carefully picked and packed. Others must be shipped in cold storage. An excellent example of successful fruit raising and export on a large scale is the orange industry of Southern California. The attention of American horticulturists was attracted to the citrous-fruit industry in the latter part of the nineteenth century, and superior varieties were introduced from other orange-producing countries. Most of the fruit grown in California is shipped in special refrigerator cars, and if a water journey is necessary, it is placed in the cold-storage compartments of steamers. California oranges are imported into the Philippines and even into Australia.

Of the fruits grown in the Philippines, the pineapple would be the best suited for large canning operations. The variety grown is not so good as some that are now being introduced. In many sections of the Archipelago the soil and climatic conditions are well adapted to pineapple culture, and one plantation has already been started. The mango is also a fruit which lends itself well to canning and preserving.[1] Jelly for local consumption is now made from the Philippine guava. It is probable also that several other Philippine fruits will be found suitable for canning and preserving in commercial quantities.

A large market for Philippine bananas, mangos, chicos, *lansones*, and citrous fruits could undoubtedly be developed in China and Japan, and for citrous fruits in Australia. A discussion of Philippine export markets for fresh fruit is more or less academic at the present time on account of the lack of fruit to supply even local demand. But the subject is mentioned because of its possibilities if Philippine fruit production is ever placed upon a scientific and commercial basis. Through the introduction of varieties from abroad and selection from the seedlings at home, and by means of improved methods of cultivation, the standard excellence of the citrous fruits (orange, pomelo, mandarin, and lemon) will be raised. Citrous orchards cultivated on scientific principles and fruit handled properly could hardly fail to yield big returns on the investment; they would supply the local market with good fruit at lower prices than at present, and the business would ultimately develop into a considerable export trade.

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[1] For discussion of canning methods, see Miller's "Commercial Geography."

The banana industries of Jamaica and Costa Rica, the two most important countries in this trade, are examples of results that can be obtained from systematic fruit culture. Jamaica now exports to the American and English markets about 12,000,000 bunches of bananas a year, and Costa Rica about 10,000,000. These are purchased from the growers on the spot at from 30 to 60 centavos a bunch, and are shipped by rail to the ports from which large steamers, specially constructed for this trade, transport them to the markets. Thus a bunch of bananas hanging in a New England store may have been plucked from the plant in Costa Rica fifteen days before. The success of this industry has depended upon the careful cultivation of the best varieties, and upon systematic transportation and marketing.[1] Total shipments of bananas to the United States in 1911 were 44,660,000 bunches containing from 80 to 200 bananas each, valued at ₱28,600,000. These were sold in the United States at about the price demanded for the better grade of bananas in Philippine cities. The number of vessels engaged in this trade is greater than the whole fleet of inter-island steamers in the Philippines.

RUBBER

Rubber originated in Central and South America and in Africa. From time to time it had received the attention of experimenters and merchants, but it was not until 1820 that anything practical was done with it. The modern rubber industry dates from the experiments of Goodyear, who found that a product impervious to water and not affected by extremes of temperature was obtained by combining rubber with sulphur at high temperatures. Later Mackintosh discovered the art of waterproofing cloth by means of dissolving rubber in naphtha. Since that time the demand for rubber has increased by leaps and bounds, as new uses have been found for it. The supply has not kept pace with the demand, however. For many years rubber was obtained in a wild state in the Amazon valley and in Africa. But the increased uses for it resulted in attempts to secure a more reliable source of supply, and experiments were made in cultivating the plants which, in a wild state, yield rubber. Plantations were established in Mexico, Central America, the Malay Peninsula, Ceylon, and other countries. The high profits which these plantations realized caused great interest in rubber cultivation, with the result that extensive speculation began in plantation stocks. These stocks were run far above their actual value, in what is known as the rubber boom. Since the break of this boom, however, the rubber-plantation industry has become more stable. At the present prices the profits from cultivated rubber are large, though not nearly so great as those promised to speculators during the rubber boom.

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[1] *National Geographic Magazine*, Vol. XIII, No. 7.

The Philippines have also been interested in cultivated rubber, but only with the opening of Mindanao and Palawan have large areas suitable to rubber growing been available. It is true that throughout the other islands there are sheltered spots suitable for rubber growing, where typhoons are not destructive, but the aggregate area of these spots is small when compared with the amount of land available below the typhoon belt in Mindanao, Sulu, and Palawan. Not only are these latter regions free from winds which break the rubber plants, but they are not visited by drought or a dry season, which unfit central and western Luzon and the western coasts of the Visayas for rubber culture. The large number of wild hogs in Mindanao, Sulu, and Palawan constitute a menace to the young trees, but these can be guarded against by strong fences. That plantations already exist there, proves that the trees grow well. The chief difficulty now is to obtain sufficient labor, and this is deterring many from entering the industry. While the Philippines are a producer of plantation rubber,[1] it is improbable that they will soon be an important factor, for the reason that the most favorable localities lack labor supply.

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[1] See "Rubber-Growing Industry of the Philippines," "Cost of Production and Products," by Dean C. Worcester, Secretary of the Interior, Government Printing Office, Washington, D.C.

The rubber situation has been complicated recently by the possibilities of synthetic rubber. One of the leading chemists of the world has stated that artificial rubber would soon be produced in commercial quantities, and below the price of either wild or cultivated rubber. If this is accomplished, it may be that tropical rubber growing will come to the same end as the indigo industry, which was destroyed by the production of synthetic indigo in Germany.

SILK

The raising of silkworms[1] would seem a possible industry in the Philippines because the climate is suitable and food for the worms is easily produced. The mulberry on which the species *Bombyx mori* feeds was introduced into the Philippines in 1593. From time to time interest has been taken in silk raising, and various persons and societies have endeavored to establish it in the Islands. The failure of these efforts has resulted from lack of financial backing. Then, too, the agriculturists never lent themselves willingly to the growing of the silkworms because of the great care that it demanded. From the year 1870 no attempts were made to introduce the silkworm until 1905, when the Bureau of Science at Manila took up the matter. As a result there are now in the Philippines two kinds of worms: (1) *Bombyx mori*, feeding upon the leaves of cultivated mulberry and producing a cocoon which is reeled; (2) *Attacus ricinii*, the Eri silkworm, which lives on the leaves of the castor plant found growing wild throughout the Philippines, and which produces unreelable cocoons from which spun silk is made. Experiments made with these two worms warrant the statement that silk raising can be carried on in the Philippines "under conditions as favorable as those which obtain in the best silk-producing countries of the world, and with the added advantage that no disease has appeared among the insects here or upon the trees used for feeding them." In countries surrounding the Philippines, silkworm diseases cause heavy losses. By law it is now forbidden to import silkworms, eggs, or cocoons into these Islands. The spread of the silk industry must take place under the close supervision of authorities, since inexperience or slovenly methods may result in diseases. In several places in the Philippines both the schools and private persons have become interested, and it would seem that the industry has already been launched. Its growth must necessarily be slow. For many years to come a considerable amount of silk produced in the Philippines can be used in the local production of cloths such as jusi (made from raw silk), silks, and pongees. The United States furnishes a large market for both silk fiber and silk textiles, so that the Philippines already have an outlet for surplus production. They also have the benefit of free trade, whereas the product of other countries pays a high duty.

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[1] See "Manual of Philippine Silk Culture," by Charles S. Banks, Bureau of Science, Manila.

ESSENTIAL OILS

For many years there has been an export of ilang-ilang oil from the Philippines. Up to a few years ago these islands were practically the only source of the oil, and the high prices received for the flowers made their production extremely remunerative. At the present time strong competition has developed in Mauritius and Madagascar, so that the current price for flowers has dropped from 40 to 50 centavos to 7 centavos per kilo.[1] It is improbable that the growing of ilang-ilang will ever give such returns as were formerly obtained. There are several other Philippine plants which yield essential oils for perfumery. The world's market is constantly demanding new perfumes, and already *Michelia champaca* is being cultivated here with the hope that the high price of the oil obtained from this flower will make it a remunerative minor export of the Philippines.[1]

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[1] *Journal of Science*, Vol. V, No. 4.

COFFEE

The coffee plant was introduced into the Philippines by Spanish missionaries late in the eighteenth century. By 1858 considerable quantities were produced, especially in the highlands of Batangas, Laguna, and Cavite provinces. In 1884 coffee exports exceeded ₱2,000,000 in value. In 1889 the Philippine industry was practically wiped out by the attacks of the fungus *Hemileia vastatrix*, and while it now flourishes in some localities, as for instance Benguet and Bukidnon, and the production for the Islands as a whole is increasing slightly, it is improbable that coffee will soon be exported in commercial quantities. The possibility that the pest will again become active, and the sure returns from copra, sugar, abaca, tobacco, and minor export crops, are against coffee.

STARCHES

The production of cassava and sago in the Philippines has already been touched upon with respect to the place of these plants in the diet of Filipinos. As the source of flour, tapioca, and alcohol, cassava is an important crop. The export of tapioca from the Philippines is a possibility. Throughout the Visayas, and particularly in the Agusan valley, the sago palm is found. In Borneo the starch from this palm is formed into pellets known as sago and exported in large quantities. Extensive swamp lands suitable for sago palms exist in the Visayas and Mindanao. Among other plants which yield commercial starches, and which grow well in the Philippines, is the arrowroot.

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[1] For Philippine essential oils, see *Journal of Science*, Manila, Vols. IV–V.

OILS

The coconut is the principal oil seed produced in the Philippines. Several other oil seeds grow here, however, and are worthy of more careful attention for export. Among these are (1) the peanut, which is produced throughout the Islands for local consumption and for forage; (2) sesame, which is grown here and there in small quantities for local use; (3) the castor-oil bean, inferior varieties of which are found in all parts of the Islands; and (4) the candlenut, which is gathered in commercial quantities in a few districts only.

ESTABLISHED NEW CROPS

This enumeration does not include all present or possible export crops of the Philippines. Other export crops in the Islands may result from the effort of large enterprises backed by either local or foreign capital. Present methods used in the production of the four export crops of the Philippines and the more important of the minor exports do not warrant the introduction of new plants among Filipino cultivators. In the older and well-settled portions of the Philippines more can be done in organizing the established industries on a firmer basis and improving the crops already grown than by introducing new crops.

CHAPTER X

LOCATION AND CHARACTER OF AGRICULTURE

THE SOIL

The rocks of the Philippines are chiefly of volcanic origin, and much of the soil has been derived from their disintegration. The result is, in most cases, a heavy red soil, exceedingly fertile on account of the minerals which it contains. It is much like the soils of the Hawaiian Islands, which also are of volcanic origin, and is well adapted to the growth of sugar, abaca, rubber, and the like. Large areas of the Philippines are covered with limestone, most of which is derived from coral.[1] Residual soils of limestone formation are not very fertile, since the soluble part has been carried off by streams, and only the insoluble clay remains. However, the transported limestone soils, such as those found in the valleys and along the coastal plains near mountains covered with limestone, are exceptionally fertile. For instance, in Cebu the hillsides are not very fertile, while some of the best agricultural land in the Islands is found in the coves. Another fertile soil in the Philippines is that resulting from the disintegration of the sandstone. Of the transported soils two are exceptionally important: (1) the fluvial soils found in the valleys, which are very rich both because of their chemical composition and of their finely divided and loose state; (2) a heavy, thick, grayish-blue soil largely derived from rocks of volcanic origin, which is one of the best soils for rice growing and is found at the base of many mountains.

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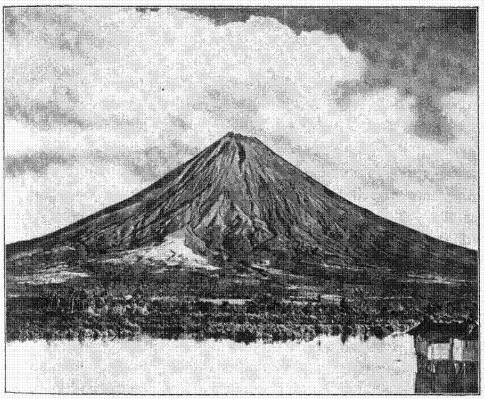
[1] For a discussion of soils in the Philippines, see *Philippine Journal of Science*, Vol. V, No. 5, Sec. A.



Abaca and Coconuts about Mayon Volcano

Rice Fields about Laguna de Bay

PHILIPPINE SOILS

CLIMATE

The average yearly rainfall in the Philippines is 2200 millimeters (88 inches), and all sections have an annual rainfall of at least 900 millimeters (36 inches). However, some of the regions which have the highest annual rainfall receive it during only six months of the year. In the chapter on rice it has been shown that the long dry season which occurs in western and central Luzon, and on the western coast of certain other islands, is an important factor in limiting the amount of rice grown to one crop. Because of the continuous rainfall on the eastern coasts of the Philippines, two and even three crops of rice can be grown there. Not only are there fewer quickly maturing crops in regions subject to a dry season, but without irrigation it is impossible in these regions to grow plants which take a year or more to mature. Abaca, rubber, and such long-maturing crops are therefore confined to those localities having a fairly continuous rainfall throughout the year.

Regions subject to heavy winds are not favorable to the growth of many plants. In the Philippines the best regions for abaca are those seldom or never visited by typhoons. Except in small, well-protected valleys, rubber does not grow well in Luzon and neighboring islands, because of the destruction wrought by typhoons. Certain roots have become the chief crops in the Batan Islands on account of the typhoons to which those islands are subjected.

The effect of temperature on agriculture is very important, since for most products there are certain limits of temperature within which their growth is confined. Only a few agricultural products such as corn and tobacco have a wide range of growth in both temperate and tropical regions. A few other products of the temperate zone will grow in the tropics but do not thrive there. Thus the white potato will grow in the Philippines, but does not do well. Variation in temperature due to latitude is not great enough within the Philippines to create zones of agriculture. Mangosteens are a strictly equatorial fruit, and even in the Philippines are found only in Sulu, Mindanao, and the southernmost part of the Visayan Islands; but other products may be grown on the lowlands from Cagayan to Sulu. However, variations in temperature due to differences in altitude greatly affect plant life here. In the lower levels are found swamp and tropical forests, the coconut, bamboo, rice, sugar, and other lowland growth. At slightly higher elevations coffee and citrous fruits thrive best. Above 1000 meters (3000 feet) the tropical forest of the Philippines gives way to pine, and it is in this region that many fruits and vegetables characteristic of the temperate and subtropical regions can be grown. Only a few high peaks of the Islands are covered with typically temperate-zone growths such as the forests of scrub oak.

TRANSPORTATION FACILITIES

With people who live in as primitive a state as the Negritos, or even the Subanuns and mountain peoples, transportation facilities have little effect on the location of agricultural activities. The same may be said of families and groups among more advanced peoples who, through their own efforts, obtain from agriculture all the products necessary for their existence. However, as soon as the commercial idea is applied to agriculture, and crops are grown for exchange, transportation becomes an important problem. In the Philippines the regions best suited to the cultivation of export crops are those along the coasts of the Islands or those connected with the coasts by water transportation. With the advent of wheeled transportation, plains and valleys have become important, since roads and railroads are constructed rather cheaply over them.

In general, then, it may be stated that the location and the character of agricultural activities is influenced (1) by the fertility and composition of the soil; (2) by the amount and distribution of the rainfall; (3) by the temperature; (4) by the intensity of the winds; (5) by the natural transportation facilities.[1]

PHILIPPINE AGRICULTURAL REGIONS

The results of these influences on agriculture in the Philippines are very noticeable. Along the coasts of nearly all the Islands are found plains of greater or less extent, most of which have a fairly uniform surface and slope gradually toward the sea. Coastal plains are nearly always fertile, since they are covered with sedimentary or volcanic deposits. Moreover, transportation is usually easy both by land and water. On the other hand, harbors bordering on coastal plains are apt to be few and poor. Most coastal plains were formed by the elevation of land masses, but most harbors have resulted from erosion and the sinking of land rather than its uplift. The most important coastal plains in the Philippines are those of the Ilocos provinces, Zambales, Mindoro Island, Antique Province, and Negros Island. However, practically all islands possess coastal plains of greater or less size, and even those found on the larger lakes, such as Laguna de Bay, are of importance. Because of their agricultural and transportation advantages, and because fishing can be carried on along their shores, the coastal plains of the Philippines are well populated in comparison with the interior sections.

Another type of Philippine agricultural region of great fertility is the plain formed through the uplift of these Islands.

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[1] When agriculture becomes capitalistic, that is, when agriculture is carried on by individuals and companies on a large scale requiring more than the labor of the owner and his family, two other considerations determine the location and character of agricultural activities — (6) the amount of labor available, and (7) the number of work animals and implements available and the amount of machinery existing or which can be acquired. The lack of sufficient labor has greatly influenced agriculture in Mindanao and other sparsely populated portions of the Philippines. The lack of work animals, of large agricultural machinery, and of modern sugar mills has retarded the growth of the sugar industry in Negros and other sugar regions.

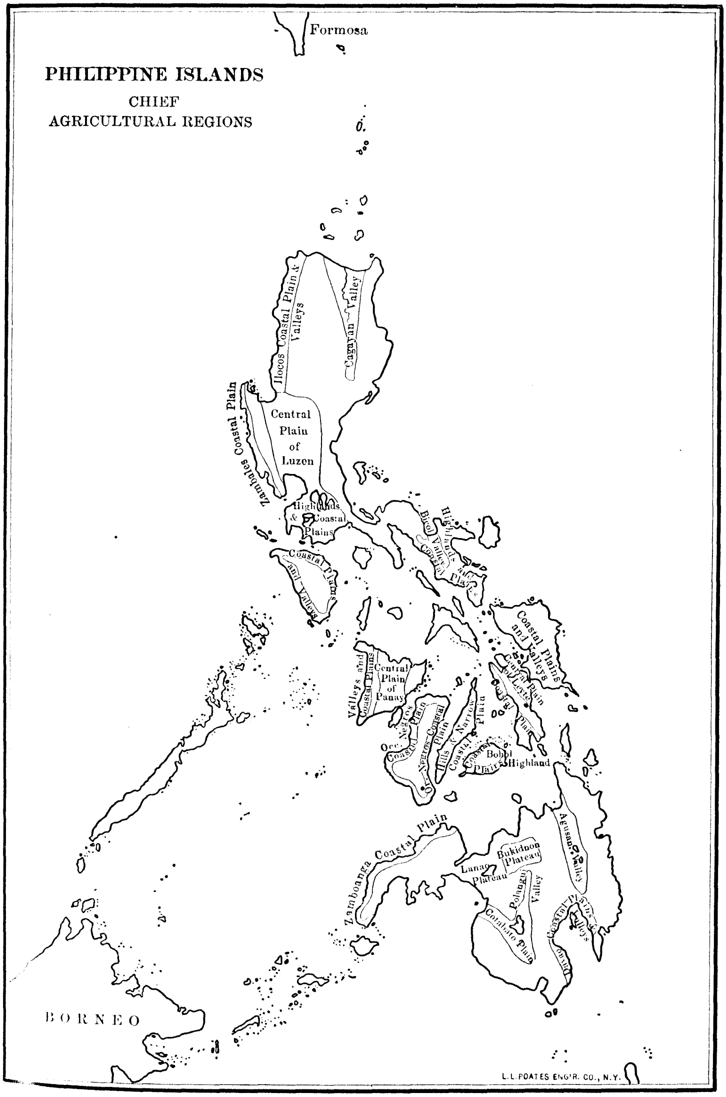

CHART XXVII. CHIEF PHILIPPINE AGRICULTURAL REGIONS

Another type of fertile Philippine agricultural region is the highland, good examples of which are found in southwestern and southeastern Luzon. The soil is usually derived from disintegrated volcanic matter, and its fertility and the fact that it is well drained make it most suitable for such plants as the abaca and the coconut. These regions are sufficiently elevated for the growth of coffee and other highland crops. The great drawback to these regions is the difficulty with which their products are transported to the coasts, but this is now being overcome by the building of railroads.[1]

Of plateaus, Benguet and the Bukidnon plateaus are the most important in the Philippines. Were it not for transportation difficulties, the Bukidnon plateau would undoubtedly be a very rich region. The amount of arable land in Benguet is limited, but the transportation system now being developed will bring it in close connection with Manila and afford it an outlet for its products.

Plateaus occupy a peculiar position in the tropics in that temperate-zone and subtropical crops can be grown on them. Both these plateaus, for instance, have furnished coffee to the lowlands for many years; Benguet will undoubtedly supply the Manila market with such temperate-zone products as berries and flowers.

A few of the hills and low mountains of the Philippines support a considerable population, as, for instance, those of Cebu (the most densely populated of the large islands of the Philippines), where thousands of people eke out an existence from the shallow limestone soil. The terraces of the mountains of northern Luzon have already been described. In other mountain regions agriculture takes the form of the kaingin system — clearings in the forest such as those of the Subanuns.

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[1] This difficulty of transportation retarded the development of the highland regions of the Philippines and resulted in land remaining unclaimed. As the result of recent settlement, land is now owned in small parcels. Hence these highland regions in the Philippines are usually very democratic in that nearly all persons are landholders and wealth is fairly evenly distributed. Many of them bid fair to develop into wealthy communities.

another destructive eruption which killed hundreds of persons on the western side of Taal, covered the surrounding country with mud to a depth of from one to three feet, and destroyed or damaged the vegetation over a large area. The earthquake wave which the eruption caused was also destructive around the shores of the lake.[1] In 1897 the lava flow[2] from the Mayon volcano destroyed plantations and towns on its sides and base. The rapidity with which volcanic ejecta decomposes and the richness of the soil thus formed often compensate for the damage wrought to agricultural land and to property in general.

The effects of calamities do not last long in the Philippines, for both the soil and the people show remarkable recuperative powers. Secondary effects may, however, persist for some time. For instance, the typhoons which swept Samar in 1908 so reduced the crops that the people were forced to look to some other means of living than agriculture. The large weaving industry of Basey, Samar, is one indirect result of these typhoons. The number of mats woven on Romblon Island has been much greater because of the decrease in the yield of coconuts caused by the typhoon which swept that island in 1908.

DRY SEASONS, DROUGHTS, AND IRRIGATION

Droughts have not been discussed with other calamities, since, unlike them, their effects can be largely overcome. The regular annual period of drought, or dry season, which occurs for almost six months in central Luzon and the western parts of certain other islands, and for two or three months in parts of the Visayas, has already been discussed with respect to its influence on the number and character of the crops grown and on seasons of agricultural activity. Extraordinary droughts, however, also occur in the Philippines. Sometimes they affect

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[1] See "The Eruption of Taal Volcano," Weather Bureau, 1911.

[2] See "La Eruption del Volcan Mayon," by P. Jose Coronas, S. J., Manila, 1898.

CHAPTER XI

DEVELOPMENT IN AGRICULTURE

The purpose of this chapter is to study the Filipinos with respect to their advance in agriculture, and to compare their achievements with those of other peoples.

Advances made in agriculture by primitive peoples are the result of environment, necessity, chance, and observation, rather than of knowledge. Even among civilized peoples who understand the use of the plow and other advanced agricultural implements, who practice crop rotation, fertilization of the soil, and selection of seed, development in agriculture has been more the result of environment, necessity, and observation, than of science. For instance, people of the United States have developed machinery for agricultural purposes because their problem has been to cultivate large areas with little labor. On the other hand, the people of many parts of Europe and Asia obtain greater yields per hectare, since they understand more thoroughly the principles of intensive cultivation of the soil. Their problem has been to obtain the greatest possible yield from their soil in order to feed the large number of persons living on it.

CALAMITIES

The natural forces which bring about most calamities are usually too great for man to control, but he can prepare himself for them so as to recover quickly from their effects. Struggle with adverse conditions of nature has developed in many peoples a vigor and resourcefulness which forms a valuable national asset.

Floods and high winds are the most common Philippine calamities. Heavy rainfall at the headwaters of river valleys, such as the Cagayan, cause the streams to rise, sometimes far above their banks. Typhoon waves occur occasionally, sometimes traveling for a considerable distance inland and causing the water of the rivers to back up and overflow the land. The damage done by floods usually takes the form of the drowning of standing crops, the destruction of agricultural lands by changes in the river channels, injury to houses and agricultural implements, and the drowning of animals. Salt water thrown on, or backed onto, the fields by typhoon waves is also destructive to crops and to soil. River floods, however, are usually beneficial in the end. The annual overflow of the Cagayan River yearly enriches the soil of the flooded area, and the amount of alluvial matter deposited by extraordinary floods often more than compensates for the damage they do. The damage of floods to crops may be prevented to a certain extent by so planting that the harvest will come before or after the floods usually occur.

Typhoons bring with them high winds. In the northern part of Luzon these are annual occurrences, and are provided for in the character of the crops grown. In the central and southern parts of the Philippines they are unusual occurrences, and their visitations are indeed calamities. Coconuts and abaca are the crops to which high winds are particularly injurious, and the effects of one storm may be felt for a long period of years. For instance, the typhoon of 1908 affected the yield of copra in Romblon for more than five years.

Eruptions of volcanoes affect only a small area, but the destruction within this area is usually great. The volcanoes of Mayon and Taal are the only ones which have done any considerable damage in the Philippines within historic times. In 1754, from May to December, Taal volcano erupted, and a large extent of cultivated land was destroyed by showers of ashes and mud, and by immense rainfall.[1] In 1911 occurred swarms of caterpillars. In a wild state, however, insects do not multiply at this rapid rate because of the checks imposed by climate, lack of food, and enemies. Heavy rains, wind, storms, and cool weather do much to hold insects in check. In regions where certain vegetation dies down for part of the year, as, for instance, during the dry season in parts of the Philippines, food is lacking for many insects. Enemies of pests include parasites, the predatory insects, birds, bats, and the like. As soon as an insect becomes abundant these enemies attack it and reduce its numbers. Fungoid and bacterial diseases also kill insects, as they do men and domestic animals.

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[1] Census, 1903.

These natural checks tend to prevent a large ratio of increase, and if they were not sometimes suspended temporarily, the relative numbers of all insects would remain constant. And this is usually the case, except where man artificially changes conditions of life in one or more of the following ways: (1) by introducing new insect or animal life; (2) by modifying the climate through the destruction of forests or the construction of large artificial water bodies; (3) by destroying insectivorous birds; (4) finally, and most important, by altering plant life through agriculture or forestry. For instance, breeding places for locusts have been greatly extended through the destruction of forests and the growth of cogon grass.

Nearly all the insect enemies of Philippine crops are kept in check by natural causes. One of the most important enemies of insects are flies which lay their eggs in the larvæ of the pests. On hatching out, the larvæ of the flies destroy those of the pest. Many pests in the Philippines, such as the rice caterpillar, are thus controlled by flies. There are extraordinary outbreaks of the spread of this caterpillar when certain climatic conditions are favorable. However, the larvæ of the flies seem to increase in a like proportion, and thus no outbreak of this caterpillar appears two years in succession.[1]

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[1] It is but natural that man should act on this knowledge of the destruction of insects by their enemies, and attempt to discover and introduce forms

only a very small area, but at long intervals the entire Archipelago is subject to unseasonable droughts. Probably the most serious of these occurred in eight months of the season 1911–1912. In June, July, and August, numerous typhoons, bringing copious rains, influenced the Philippines, and planting conditions were excellent. In the critical months for the rice crop — October, November, and December — there was an almost total lack of rain throughout the Islands and their vicinity.[1] This caused a large reduction in the rice crop. Corn, root crops, coconuts, abaca, and in fact almost all crops were injured by the long period of dry weather.

If extraordinary droughts happen at planting time, they usually result only in delay and a late field crop. If a field crop has already been planted, drought may result in its destruction or in a reduced yield. The yield of long-maturing crops, such as coconuts and abaca, is always affected by continued dry weather, and abaca may even be destroyed by drought of long duration.

The effect of drought can be reduced by conserving the moisture in the ground. The method of accomplishing this is called dry farming. It has been highly developed in the United States on the dry plains of the Northwest. Certain regions there have only a small annual rainfall, and this occurs during a very short period. When the rains are over, the crops are planted. Then they are frequently cultivated in a shallow manner so that a layer of dust forms over the whole field. This dust mulch prevents the escape of moisture from the ground by evaporation and conserves it for the use of the plants. By this system of dust mulches it is probable that certain field crops, such as millets and corn, could be grown in the Philippines during the ordinary period of the dry season, and that the yield of long-maturing crops could be increased. However, dust mulching is of utmost importance in keeping alive long-maturing plants during periods

[1] See "The Extraordinary Drought in the Philippines, October, 1911, to May, 1912," Weather Bureau, Manila.

of extraordinary drought. During the extraordinary drought of 1911–1912, for example, coconut groves which were cultivated so as to produce a dust mulch were little affected in their yield, while uncultivated groves decreased 50 per cent in the production of nuts. In Davao the case is reported of abaca stalks on an uncultivated plantation falling over from lack of moisture, while on a neighboring plantation the stalks were kept alive by shallow cultivation which conserved the moisture in the ground. The yield of the latter plantation was interrupted only six months, while no stripping could be done on the former plantation for over two years. The cost of cultivation necessary to produce and maintain the soil mulch is so little that this method is extremely practicable.

Soil mulch merely reduces the damage done by drought. The effect of long periods of dry weather can be wholly overcome only through irrigation. Even among as primitive peoples as the Bontoks and the Ifugaos, we find the value of irrigation understood and the more simple methods of accomplishing it practiced. Irrigation for the production of crops antedates the Christian era by thousands of years. In all parts of the world are found remnants of irrigation works, some of them of immense size. To-day there are actually regions in which water is still carried to the fields by human beings. Many devices, worked by human or animal power or by river currents, are used to raise water and spread it over the fields. Occasionally the topography of the land to be irrigated and the position of the streams is such that water can be diverted from rivers by dams. Small areas can be irrigated by means of power pumps. In certain parts of the world the geological formation is such that good results are obtained from artesian wells, and these are often utilized over a considerable area.

None of these methods, however, supplies a sufficient amount of water to be of great value, and with the exception of artesian wells all of them depend more or less directly upon rainfall. Throughout the world reservoirs and irrigation systems are now being built so as to insure a constant water supply.

and to bring into cultivation land which otherwise could not be used. Great reservoirs are built and in these water is impounded and conserved during the season of rainfall or flood, to be conducted to the fields below when needed. Such irrigation schemes are found throughout the world and most of them are immense projects. Sometimes they are built by private capital, but their great size and the number of interests involved often necessitate their construction by the government.

In India there are 18,000,000 hectares under irrigation. Of these 7,200,000 hectares are irrigated by government works.[1] Egypt has about 2,500,000 hectares under irrigation, and this area supports a population of 5,000,000 in addition to the payment of an immense interest on the national debt. Cape Province, South Africa, is wasting enough water to supply over 1,000,000 hectares of land. There are systems, however, supplying water to about 200,000 hectares.[2] Australia supplies irrigating systems with water from artesian wells. The annual yield from these wells in the Murray River basin alone amounts to over 750,000,000 cubic meters. These, with the other water supplies of that country, are under a strict government control.[3]

Filipinos have several primitive forms of irrigation. In a few places human treadmills, such as are found throughout the East, are seen. In parts of the Philippines sweeps worked by human power raise pails of water and empty them into irrigation ditches. Carabaos are often employed to run water wheels, which are also sometimes operated by the force of the current. Temporary dams are often built to divert water from rivers. Pumps are being employed to a small extent, and in the Central Plain of Luzon artesian wells are being used to irrigate small tracts.[4] It is estimated that permanent systems of irrigation in the Islands serve about 50,000 hectares of land. These usually consist of permanent dams for diverting rivers, and of ditches for leading water to the fields. In a few places there are reservoirs.

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[1] Robert Buston Buchley's "Irrigation Works of India."

[2] *Bulletin of the Imperial Institute*, June, 1912.

[3] *Review of Reviews*, XXXIV, 620.

[4] These were originally sunk by the government to get a supply of potable and clean water. They are now found throughout the Philippines, but the best results are obtained in the Central Plain of Luzon where the geological formation is favorable.

Irrigation in the Philippines is of the most importance to rice, and has already been discussed in the chapter dealing with that cereal. Irrigation of sugar cane and other crops will generally be profitable. In regions subject to a dry season, irrigation will result in the growing of more than one crop of rice or other cereal during the year, and will permit the introduction of long-maturing crops such as abaca. In all regions, whether subject to a regular dry season or to an even distribution of rain throughout the year, irrigation will give greater stability to agriculture in making crops independent of rainfall.

Small irrigation systems may be built by the owners of large haciendas. Combinations of local capital may be sufficient to undertake the construction and maintenance of systems such as are found in Ilocos Norte, northern Tarlac and Boac, and Marinduque. However, almost all irrigation projects must result from the initiative of the government.

The deciding question in India in determining what sections should first receive the aid of the government in the form of irrigation works has been, Will it pay? Responsible officials in the Philippines have to consider the amount of land to be benefited and the cost per hectare, the attitude of the landowners toward the project, their ability to repay to the government the initial cost plus the running expenses, and the location of the project with respect to other projects of a similar sort. It is recognized that government works should be distributed throughout the Islands. The revised irrigation law provides for the collection of water rent and running expenses of the plant in the form of taxes, the water rent forming a fund for the repayment of the original cost. By spreading this repayment tax over a term of years the farmer is not seriously incommoded, since the total addition to his taxes is, in normal years, but a small part of the additional income received from a more abundant crop. Contrary to the custom in many countries, notably India, the government expects no direct revenue from the irrigation systems it builds. The funds expended are regarded as the money of the people devoted to the purpose of increasing the economic prosperity of the country.

Guided largely by these considerations, the officials in charge of the irrigation work are carefully studying every inhabited section of the Islands where the water supply and general topography give promise of conditions suitable for land irrigation. Thus projects in Cagayan and the Ilocos provinces are considered along with those of central and southern Luzon, Panay, and Leyte; even central Mindanao, especially the Cotabato River valley, has received a preliminary examination. In this way irrigable land amounting to about 485,000 hectares[1] has been located.

The work is one naturally attended with many difficulties and disappointments. The land contours must be accurately determined, a task which involves weeks and months of labor, often in the depth of the jungle. The rivers and streams of the region must be carefully examined and both the maximum and minimum flow of water definitely measured. In the typhoon belt this is extremely important because, while money must not be wasted in excessively strong works, all construction must be strong enough to withstand the greatest possible strain, even though the rainfall which causes the strain may not come for a period of many years. Then, too, the composition of the earth strata beneath the dams and main canals must be carefully determined by test wells. The strata must be of a sort to uphold the weight of the dam and retain on the surface the body of water. This is of the utmost importance, since a very expensive system could be rendered absolutely useless by excessive water seepage, and the complete collapse of a dam may be brought about by the flow of underground waters.

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[1] *Philippine Agricultural Review*, Vol. V, No. 4, p. 178.

The irrigation system on the friar lands of Cavite furnishes an example of a successful project. This system contains 135 miles of ditches, 117 dams, and 12.5 miles of tunnels. These convey water to 21,000 hectares, which produce yearly about 1,000,000 cavans of rice. The product per hectare averages from two to four times[1] that of the nonirrigated lands of the immediate vicinity. One important project is now (1912) under construction. The San Miguel, Tarlac, project will serve 4000 hectares at an expense of ₱271 per hectare. The Santa Barbara project in Iloilo Province will serve 4000 hectares, at an estimated total cost of ₱190 per hectare, and is proposed for construction as soon as legal requirements have been met. A large number of smaller projects have been examined and their construction will begin as soon as conditions permit. These projects include nearly every province in the Islands.

Unfortunately the natural difficulties are not the only ones with which the engineers have to contend. In some cases a system has been surveyed and found feasible, only to be laid aside because of the opposition of the farmers whom it was intended to benefit. Various reasons are given for this opposition, but it seems to be based on a fear of the yearly tax payments, and is, in part, the result of past difficulties over the payment of land taxes. This opposition can best be met by showing the benefits of completed systems, and it will undoubtedly die out as new systems are put into operation in different sections. Any successful system under government control must be administered in a manner absolutely fair and just, both as regards the collection of dues and the distribution of the water. Only in this way can the superintendent win and retain the confidence and good will of the farmers with whom he has to deal.

The installation of irrigation systems in the Philippines is of greatest importance to the inhabitants. Irrigation will increase the food supply by increasing the number of crops and will give stability to agriculture by insuring the production of full crops

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[1] *Manila Times*, May 15, 1912.

PESTS

All crops are more or less subject to attack by pests. Some pests have little ill effect on the vitality of plants and the amount of yield. Others are very destructive.

It is seldom that pests can be absolutely exterminated, but most of them can be held in check or the effects of their ravages lessened. A few of the methods used in connection with different pests may be mentioned.

1. The most obvious methods, and those used by primitive and civilized people alike, are the mechanical protections, such as scarecrows for birds and fences for pigs. In some regions bands of tar or other substances are applied to the trunks of trees to prevent worms and insects from crawling up into the foliage.

2. Many pests can be killed by hand or by mechanical means. For instance, locusts are driven into ditches and there exterminated; rats and other animals are caught in traps; tobacco worms are picked from the plants.

Other methods employed in the extermination of pests are the results of scientific investigation and close study.

3. Poisons and insecticides are used throughout the world.

4. By careful study the breeding places of pests can be discovered, and this knowledge offers an excellent method of control. The destruction of rubbish and dead trees protects coconut groves from the rhinoceros and other beetles.

5. Sometimes certain forms of life destructive to pests are found. The increase of any insect would be very large if the natural restraints were removed. For instance, a single female of one of the commonest moths lays over five hundred eggs during its life. Of these, two hundred can be reared to moths under artificial conditions; these produce fifty thousand eggs. Of these again twenty thousand moths reach maturity and produce five million eggs. This is the rate of increase of insects living in captivity, and shows that the increase of one moth in three generations is equivalent to ten large and devastating

6. Often one variety of a plant, more hardy and better able to withstand the attacks of pests, can be substituted for other varieties. For instance, the coffee industry of the Orient (including the Philippines) was practically destroyed by blight which cannot be controlled below a certain altitude. Arabian coffee is most susceptible to this disease. On the other hand, other species of coffee, such as the Liberian, are more or less resistant to the blight. Hence such varieties and their hybrids are frequently planted instead of the Arabian.

7. Lessening the effect of pests by changing the season of planting is sometimes resorted to. An excellent example of this is afforded by the history of the cotton-boll weevil. This insect was introduced into the United States from Mexico and has spread over half the total cotton region of the country. Although much attention has been given to its control or destruction, no parasite or other natural enemy has been discovered. It cannot be poisoned, and mechanical means of killing it have failed. A study of its life history, however, brought out the fact that weevils were comparatively few in number immediately after winter, but multiplied rapidly during the warm weather. It had been the custom in Texas to

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of life that will be destructive to pests. The most advanced agricultural countries have spent much money and labor in searching for such checks, but so far there has been an almost complete record of failure. The scale which attacked the orange groves in California was destroyed by a ladybug introduced from Australia, but this is an exceptional case, since the scale in question was also introduced from Australia. By inoculating rats with virus an epidemic disease destructive to them is caused. Much money and labor have been spent in searching for a fungus which will exterminate locusts. The danger of introducing animal or vegetable life which will in turn become destructive to agriculture must be recognized. For instance, ferrets have been introduced to kill off rats, but are themselves very destructive to poultry. The gypsy moth was introduced into the New England States in connection with scientific study, and has already proved exceedingly destructive to the foliage of trees. Millions of dollars have been spent in attempts to eliminate this pest, and it is only with great difficulty kept in control. Rabbits were introduced in Australia for sport, but they multiplied so rapidly that they became one of the greatest sources of damage to many crops. (See H. Manwell-Lefray's "Indian Insect Pests," Calcutta, 1906, office of the Superintendent of Government Printing, India.)

plant cotton late. The plan now adopted is to plant early-ripening varieties, and thus a good crop is picked before the army of weevils has reached anything like the maximum. The cotton field is then plowed up and burned so as to kill as many weevils as possible. Thus a profitable crop of cotton is grown in Texas where, under old conditions, nine tenths of the normal crop was destroyed.[1] The boll weevil is also found in the Philippines.

The chief agricultural pests in the Philippines have already been mentioned in connection with food and export crops. Rats are particularly destructive to rice. They may be held in check by traps, poison, or virus. The chief enemies of corn are weevils, which can be prevented from attacking the grain by growing a hard variety well covered by husk. Swarms of locusts sometimes occur in the Philippines, particularly after an extraordinary dry spell, such as that of 1911–1912, which is favorable for their growth. They are very destructive to many crops, such as rice, sugar cane, corn, and coconuts. While they are attacked by many predacious animals, insects, and fungi, the swarms increase so rapidly that they can be destroyed only by mechanical means or by insecticides. In the Philippines they are driven into trenches and there killed, or insecticides such as arsenics and kerosene are used. Locusts breed in grasslands, and, as the Philippines become more settled, will probably disappear. In the meantime their occasional advent makes necessary the coöperation of all the inhabitants of the regions affected, and the intervention of the government to annihilate the swarms of adults, and the young before they can fly. The control of coconut beetles by the destruction of their breeding places has already been discussed. The tobacco worms can be held in check by picking them from the plants and by trapping the moths by light. In sparsely populated regions wild hogs and deer are destructive unless kept out of the fields by strong fences; they are particularly dangerous to the numerous new coconut plantations.

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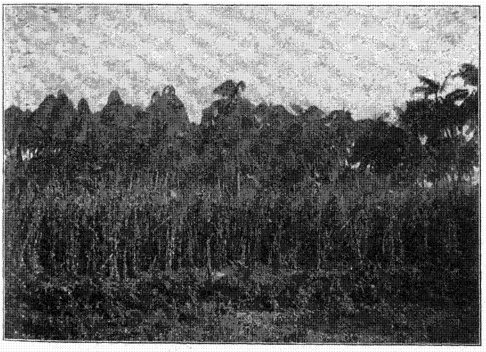
[1] *Review of Reviews*, February, 1904, pp. 188–191.

Only one important industry in the Philippines has been seriously affected by pests, and that is the coffee industry, which was practically destroyed in 1889, although it is again becoming important in certain highland regions. On the whole, however, it may be stated that, considering the climate and the small amount of attention agriculturists give to the control of pests in the Philippines, the destruction wrought by them is very small indeed. The natural checks hold most of them in control.

AGRICULTURAL MACHINERY

Civilized men have far outdistanced primitive tribes in cultivating the soil. The kaingin system among the Subanuns has already been discussed, and it has been shown that these people cannot use the same land for a long series of crops because their implements are too crude to work in hardened soil covered with grass. Moreover, they do not understand how to treat the soil in order to prevent it from hardening and to retard its exhaustion. Kaingin are also made by Filipinos to a small extent. Many clearings of a permanent nature are also being made each year, for as population increases new land must constantly be brought into cultivation. In forests the undergrowth is cut down and burned, the large trees are felled, destroyed, or removed, and the stumps are pulled up from the ground, blown up by dynamite, or burned out. The first crop planted is often corn. On the Manobo farm of Butuan it has been demonstrated that it takes three years to clear forest land and put the heavy, clayey soil in proper condition for general crops. The cultivation of legumes and the use of green manure have met with great success in preparing the soil. Cogon grasslands are burned off, broken up four or five times with the plow, well harrowed, and planted. The grasslands of the Philippines are best brought into cultivation by steam or cable plows, which are able to tear apart the mass of roots sent out by cogon.



A Swarm settled on Cultivated Vegetation

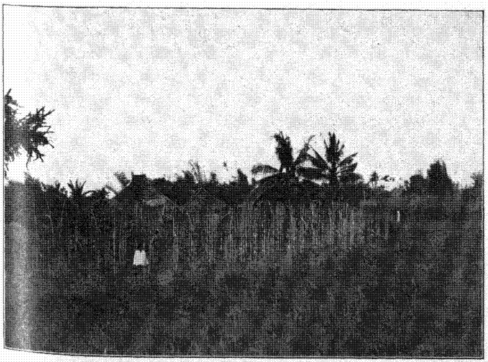


Photo by Bureau of Agriculture

Effect on a Cornfield

LOCUSTS

must be built to sell within the purchasing power of the small cultivator in the Philippines. For large sugar plantations and other estates power machines, both traction and cable, are required, and these also must meet local soil and cultural conditions.[1]

REMEDIES FOR SOIL EXHAUSTION

The tendency of plants to exhaust the soil can be retarded or prevented in four ways:

1. Exhaustion may be retarded in certain instances by fallowing. This is practiced in the Philippines in the cultivation of sugar cane, where after the crop is gathered the land is allowed to remain idle. Where only one crop is grown and the fields are allowed to lie idle during the dry seasons, rice does not seem to exhaust the land. Cases may be cited where large Philippine areas have been grown to rice for at least a hundred years and still produce crops without the use of fertilizer, which is probably due to the effect of the sun and air on the soil during the dry season. Nearly all the soils grown to rice crack open when exposed to the air and sun.[2]

2. The fertility of the soil may also be maintained by rotating certain crops. In temperate regions the rotation of crops has been carefully studied, but not much investigation of this subject has been made in the tropics. One authority,[3] however, has suggested that such crops as yams (ubi, etc.) be planted the first year, corn the second, sweet potatoes (camotes) the third, and castor oil or some such crop the fourth. Sugar cane is frequently followed by beans and corn; rice is then planted and followed by beans and corn again; then comes a second crop of rice, after which sugar cane is again planted. An important effect of rotation is the resting of the various layers of soils, since the roots of different plants

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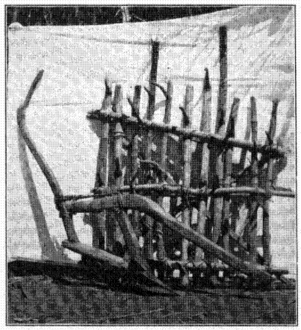
[1] From information by the machinery expert, Bureau of Agriculture.

[2] *Bulletin No. 22*, Bureau of Agriculture, Manila.

[3] H. A. Alford Nicholls in "Tropical Agriculture."

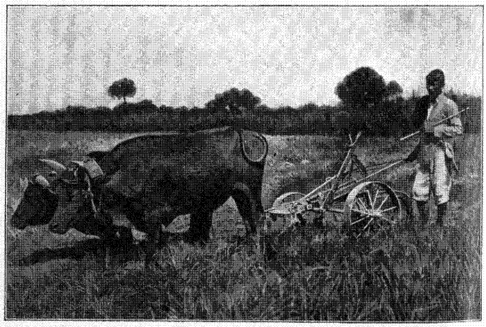
The most primitive forms of agricultural implements are those used in the hack system, that is, the digging stick, the wooden shovel, and the hoe. Subanun and mountain peoples, as we have seen, have not advanced beyond this system. The Filipinos, however, employ the plow and harrow almost entirely. In fact, as has been seen in the rice industry, when carabaos and cattle are not available for pulling plows, agriculture languishes or stops. The Filipino plow and harrow are most primitive, but are being gradually superseded by more advanced forms. The plow in its simplest form consists of a crooked limb of a tree pointed at one end. This crude, one-handled affair merely scratches the soil and results in very shallow cultivation. A cast-iron share and moldboard are now generally attached and do fairly good work. The harrow used here is made of bamboo and does not pulverize the ground nearly as thoroughly as is necessary in order to produce a well-prepared soil.


PHILIPPINE PLOW AND HARROW

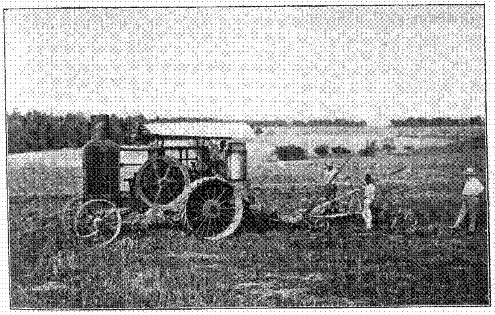
Cultivation of crops in the Philippines is done by the primitive plow or by hand, and except in a few places where special machinery has been introduced, the crops are harvested by hand.

The invention or adaptation of machinery is not a simple matter and, as mentioned in the discussion of rice machinery, must be the product of experience. For instance, all the heavy plows imported into the Philippines have proved unsuccessful, while the lighter and smaller plows have given satisfaction but are too expensive. Moreover, the point at which the carabao is attached to the plow must be lower than that at which the American horse is hitched. Experience has proved that plow points and shares made of the iron from Angat, Bulacan, give great satisfaction in most Philippine soil. From this composition of metal probably better plows can be made than those now being imported into the Islands.

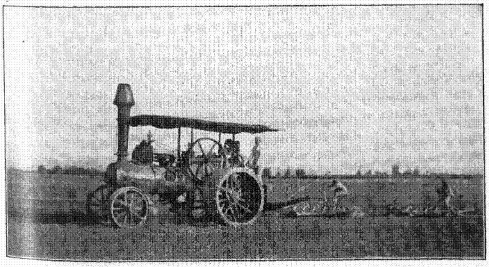
Up to three years ago little had been accomplished in the introduction of more advanced agricultural machinery into the Philippines. Recently, however, much interest has been shown, and large and small machinery has been imported in considerable quantity. Much can be done in adapting such machinery to local conditions. The problems connected with agricultural machinery in the Philippines relate to two classes: small agricultural implements for small owners and small fields; large machinery adapted for use on sugar plantations and other large fields. For the small farmers a light general plow, light disk harrow, an iron smoothing harrow, one-row corn planters and drills, and two- or three-shovel cultivators are necessary. These



A MODERN PLOW AT WORK



Plowing with a Gasoline Traction Engine



Harrowing with a Steam Traction Engine

LARGE AGRICULTURAL MACHINERY FOR ESTATES are sent down to different depths. In addition, a proper system of crop rotation prevents vegetable and animal pests. While different crops are planted one after another in the Philippines, the idea of the planter in doing this is not to rest the soil but rather to use the land as much as possible. In the Cagayan Valley tobacco and corn are rotated, and in other districts rice alternates with sweet potatoes or other tubers.

3. Some plants, such as green gram and the cowpea, gather nitrogen and leave it with their roots in the soil. Many times the plant is not used at all, but is cut off before it matures and turned into the soil. These crops are planted with or before starch crops, such as the potato, the growth of which is aided by the nitrogen thus left in the soil. This fact has been understood in the Philippines, and green gram is sometimes planted before a starch crop. The cowpea and manioc have been recommended as crops which can be planted together, the cowpea supplying the nitrogen needed by the latter.[1] In the Philippine regions affected by the dry season but provided with irrigation facilities, a crop rotation of corn with cowpeas between rows planted during the dry season and followed by two crops of rice would probably be successful. The fact that the first period in the growth of rice occurs in seed beds makes it possible to accomplish this rotation within the space of one year.

4. Exhaustion of the soil may be prevented by adding fertilizers to it. Fertilizers are usually divided into two classes: (1) the general fertilizers, which include farmyard manure, ashes of the waste part of crops produced upon the land, the waste products of towns, and the like; (2) special fertilizers, or artificial fertilizers, sometimes also called commercial fertilizers, which contain large quantities of nitrogen, phosphates, lime, and potash in varying proportion, according to the crops which they are intended to fertilize. They are made from numerous products, such as guano, bones, oil cakes, slag, shells, gypsum, and many other minerals. Unless fertilizers

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[1] *Journal of Science*, Vol. III, No. 2, Sec. A.

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[1] *Journal of Science*, Vol. III, No. 2, Sec. A.

are properly and intelligently applied, however, their use may result in more harm than good.

Owing to the abundance and cheapness of land in most places, Filipinos have never properly studied the remedies for soil exhaustion.

IMPROVEMENT IN CROPS

In Chapter I it was seen that most Negritos now plant a few crops, that the Subanuns are fairly well advanced both in the number of plants grown and in the variety produced, and that the mountain peoples excel both these tribes in agriculture. It is a most natural thing that primitive man should eventually plant the roots and cereals which he has found and consumed in a wild state. Once the idea of agriculture is grasped, the number and quality of crops is increased by the importation of new plants, and by plant breeding, cultivation, and selection.

Improvement by cultivation is illustrated by every crop now grown by man. Plants freed from the noxious effects of weeds, and cultivated in soil more or less carefully prepared, produce their useful parts in larger proportions than when growing wild. Moreover, the greater the care exercised in cultivating any crop, the greater is its utility. The kernels of grains have increased in size and number over the wild grasses from which they came. Vegetables have been increased in size and palatability. The flavor, size, and color of fruits have been increased, and the seeds of many of them have been reduced in size or even entirely eliminated.

The tendency of plants to improve in favorable localities with careful cultivation is emphasized by selecting the seeds of the best plants for reproduction. Less advanced agricultural peoples usually practice seed selection unwittingly. According to Mr. Roy F. Barton, the excellence of Ifugao[1] rice is probably due in great part to selection of seed. In most districts the largest heads having the largest grains are carefully

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[1] Economic Report by Roy F. Barton, Ifugao.

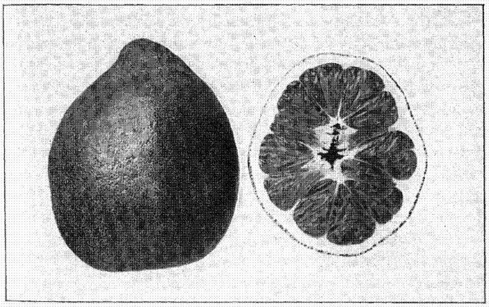

Photo by Bureau of Agriculture

AN EXCELLENT TYPE

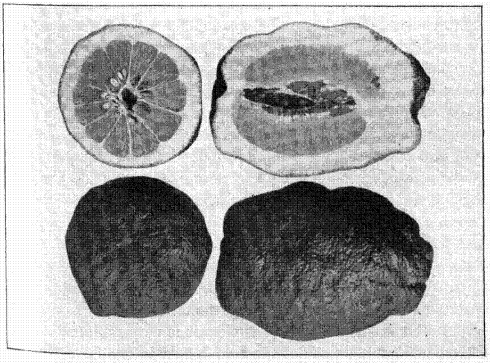

Photo by Bureau of Agriculture

AN INFERIOR TYPE

CITROUS FRUITS

selected and bound into bundles for the next year's planting, but this is not due to any scientific knowledge on the part of the Ifugaos. The custom results from a religious superstition, for they believe that if large grains from large heads are planted, by analogy the next year's crop will have large grains and large heads. Improvement by selection is understood and intelligently carried out only among the most advanced agricultural peoples. Thus wheats from the northern parts of America mature in much less time than those from the southern part, and, as has already been noted, the introduction of the quickly maturing northern cottons into Texas has partly solved the problem of the boll weevil. In the United States flax plants are grown for their seed, in Russia for their fiber. In many parts of the Philippines the pineapple plant is valued for its fiber rather than for its fruit. In the United States one variety of corn may be grown because it is rich in oil, another because it contains more starch in proportion to the other constituents. In the same way certain wheats are selected and grown for the macaroni trade, since these contain a larger proportion of gluten than the ordinary wheats.

In general, it is true that Filipinos do not understand improvement of plants by seed selection. On the contrary, selection in certain crops is often so made that the best plants are consumed or sold, leaving the poorest to produce the seed for the next season's crop. Perhaps one exception should be noted, and that is the selection of the variety of rice grown. In a few localities the best varieties are always selected. After the drought of 1911–1912 early varieties of rice were planted in many localities so that the crop, since it was planted late, would mature more rapidly than usual. But, as has already been noted in the discussion of rice, it is very seldom that any attempt is made to select the best heads in the field for raising the next season's crop. Probably every crop grown by Filipino agriculturists could be improved by selection.

It must not be thought that the great advance made in the varieties and types of plants has resulted only from selection in the fields. Certain men have made the evolution of "new plants" their life work, and the results obtained by them have been accomplished by both selection and crossbreeding. Examples can be taken from almost every line of agriculture. Two which are of importance to the Philippines are corn with ears well covered by the husk as protection against weevils, and the hybrid coffees, which are more resistant to the coffee pests than the Arabian species.

DIVERSITY OF CROPS

The Philippines are an excellent example of a country whose agriculture is largely dependent on foreign plants. We do not know what plants were brought into the Philippines before the arrival of the Spaniards, but the Europeans found already growing in the Islands rice, coconuts, sugar cane, yams, taro, bananas (including abaca), and several other plants of minor utility. Since that time tobacco, corn, maguey, cacao, coffee, the papaya, chico, guava, a great variety of vegetables, and several other minor economic plants have been introduced from Central America and other parts of the tropics. Even to-day new plants, such as the fruit known as the roselle, are being brought into the Philippines. Plant introduction formerly resulted from the activities of merchants, travelers, or sea captains, but to-day governments and even private individuals send out agricultural explorers to search the entire world over for plants that will grow in certain soils and climates. Thus the agriculture of all advanced countries is becoming more and more diversified.

It must not be thought that diversity of production is synonymous with self-sufficiency. The policy which has for its aim the domestic production of all articles required by the family or the community or the country is open to criticism. On the other hand, the policy which makes the agriculturist, the agricultural community, or country dependent upon one crop places agriculture on a very unstable basis, particularly in the tropics where the amount of yield and the demand for certain agricultural products fluctuates so much. The history of commercial tropical agriculture seems to present a succession of "bonanza" crops. The uses of a certain tropical plant being recognized in Europe and America, its planting was begun in the tropics. A brisk demand for its product ensued, and good returns were realized. Then there was a rush to extend the plantings and to take advantage of the rising prices and large profits. Methods of planting and of producing the commodity exported received little attention. There was much waste from poor methods, and the land was not utilized to its full capacity because energy was concentrated on this one crop. Extensive rather than intensive methods were employed, but large profits were made because of the high prices obtained for the product.

But the turning point was always reached. Then the industry was wiped out, or placed on a stable basis such that good profits could result from careful agricultural methods. The sugar industry of the West Indies is an example of an industry almost destroyed and later placed upon a stable basis. Enormous profits were first made with crude methods, but as soon as economic methods and government aid produced sugar more cheaply from beets, the sugar industry of the West Indies was almost destroyed. It was renewed only by adopting improved methods from the beet-sugar industry. The coffee profits of Ceylon were wiped out by a pest, and later the Cinchona industry felt the effects of overproduction. The indigo plantations which for a time produced such large fortunes in the Ilocos provinces of the Philippines were made unprofitable by the production of synthetic indigo. The competition of sisal fiber helped to reduce the profits from abaca plantations, and will probably seriously affect that industry unless better methods are employed in the cultivation and stripping of abaca. Millions of coconuts are now being planted in the tropics. This is the result of high prices offered for copra. However, the demand will sometime be supplied, and profits will then be made only from groves which are well planted and cared for, and the product of which is carefully prepared. The small plantings of maguey were profitable in the Philippines when the price of agave fibers was high. With the present increased production and low price, maguey is profitable only in large plantations where every advantage can be taken of the reduced cost of large production and of most advanced methods.

Because of their production of export crops, the Philippines are dependent on foreign countries for a large portion of their food supply. The Islands import rice because large sections produce abaca fiber, copra, sugar, or tobacco for export, importing rice in exchange for these crops. Hence a short crop in southeastern Asia, or political unrest there, means a curtailment of the rice supply of the Philippines, high prices, and suffering among the poor. The ideal condition would be one in which the Philippines produce enough rice to supply local needs, raising and exporting products only in exchange for cotton goods, steel, luxuries, and other articles which cannot be produced here at all, or only at a much higher cost than that of imported goods.

It is interesting to note that Laguna Province[1] was not much affected by the scarcity of food after the drought of 1911–1912 for the reason that the diversified products raised there insured the people against famine. On the other hand, after the typhoon of 1898, which partially destroyed the copra and abaca of Masbate,[2] the rice imports into Masbate diminished because the people had nothing left to exchange for rice. This condition caused considerable suffering among them, and many had to "take to the hills" in order to find food. Another interesting example is that of the people of Cagayan Jolo,[3] who had depended almost entirely for their living upon export of copra and cattle and had bought their rice from Palawan. In 1910 this source of supply was suddenly cut off from them; several trading boats were sent to the Palawan coasts and returned empty. Hence, although the people had plenty of copra and cattle, they were unable to buy rice and had to subsist on coconuts and a limited amount of wild roots found on the island. They immediately began to plant camotes and rice, but owing to their inexperience the first crop was practically a failure. The second was much better, however, and at present the possibility of a rice famine on Cagayan Jolo is remote. Another very pertinent example can be taken from the abaca region of the Bicol peninsula. If the occupants of the small abaca fields had been used to planting food crops around their houses, instead of being entirely dependent upon the abaca, they would have been able to tide themselves over the time when the low price of hemp no longer provided an adequate living. As it was, being entirely dependent on hemp stripping, they abandoned their fields when the price of hemp became so low that they could no longer obtain a living from them.

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[1] Economic report by R. G. McLeod.

[2] Economic report by James C. Scott.

[3] Economic report by H. C. Stanton.

It holds for the individual, the family, the community, and the country that the safest and sanest condition of agriculture is that in which a sufficient amount of food is raised locally to provide for ordinary needs, and export crops are grown to exchange for products not absolutely necessary for existence. It is probable that the food crops raised in the Philippines could be increased to the point of supplying local demand without decreasing the amount of land devoted to export crops. The yield of rice and corn per acre can be made larger, and much idle land can be brought into cultivation. The present problem of providing a domestic food supply can be met not only by general increase in rice and corn production but also by greater utilization of small parcels of land in planting such crops as corn, sweet potatoes, beans, bananas, and garden vegetables in patches for family or local consumption supplementary to the staple food.

SUMMARY

The Philippines are not among the more advanced agricultural countries of the world. However, this is a situation not without hope. The farmers in what are now the advanced agricultural countries did not work out their problems for themselves alone. The greatest and most lasting results have been obtained from the study and experiments of expert agriculturists and scientists in different parts of the world, and have been carried to farmers by all the modern means of publicity — publications, lectures, demonstrations, and the like.

Efforts for bettering agricultural conditions in the Philippines have extended over a period of several years. It is probable that advance in agriculture in the Islands will be slow, but with education of the masses and the example set for them by agriculturists who have had special training or experience, adoption of modern methods will ultimately result.

Like all other countries the farming districts in the Philippines differ in the character and intelligence of their population. In the wealthiest and most progressive communities considerable advance in agriculture has occurred in the last few years.

CHAPTER XII

LAND TENURE

INTRODUCTION

The total land area of the Philippines is about 120,000 square miles, or 30,000,000 hectares.[1] It will be seen by referring to Chart XXVIII that one half this area is forested and the other half open land. It is probable that all this was once forested, and that not until the Malayan peoples came were kaingin and permanent clearings made which resulted in open lands. About 33⅓ per cent of the original virgin forest remains, 16⅔ per cent has grown up again in second-growth forest, about 40 per cent is open grassland, and only 10 per cent is the total area now cultivated.[2]

The problems concerning tenure of Philippine agricultural lands fall under two considerations: (1) the size of parcels: and (2) the system of cultivation with respect to laborer, owner, and country.

SIZE OF PARCELS

Most primitive peoples have no conception of ownership of land, for they do not occupy a region permanently and often are not directly dependent on the land for food. However, as soon as a man brings a bit of land into cultivation, he appropriates it for himself. Most Negritos observe the right of the cultivator to the exclusive use of the land he has cleared, and some even place a value on such land. Among the Subanuns a kaingin is owned by the family that has cleared it, and the right to use it can be exchanged. Among advanced agricultural peoples improved land becomes the chief form of wealth. Rice terraces compose almost all the wealth of the mountain peoples of Luzon, among whom private ownership of land is recognized.

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[1] The following areas are given for comparison:

Cuba, 44,000 square miles
Austria, 116,000 square miles
Ecuador, 116,000 square miles
Philippine Islands, 120,000 square miles
Great Britain, 121,000 square miles
Japan, 175,000 square miles
Chile, 291,000 square miles
Mexico, 767,000 square miles
India, 1,773,000 square miles
United States, 3,567,000 square miles

[2] These estimates are from reports by the Bureau of Forestry. The Bureau of Agriculture estimates the area of cultivated land as 15 per cent of the total area. In many countries of Europe all available land is cultivated. Even in the United States, a comparatively new country, 46 per cent of the land is in farms and 25 per cent of the land is improved. In Java 40 per cent of the land is cultivated.

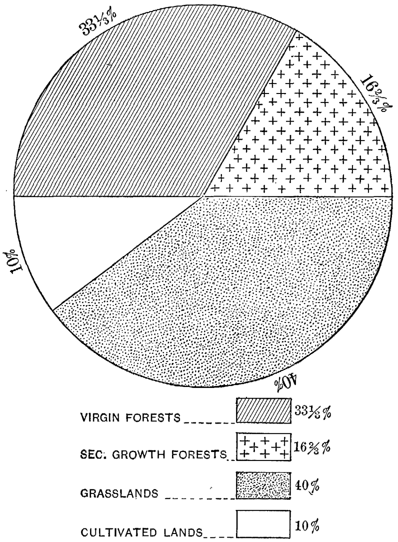

CHART XXVIII. COVERING OF THE PHILIPPINE LAND AREA
Bureau of Forestry Estimates

The areas cultivated by the Filipinos may be considered as divided into small parcels, parcels of medium size, and large parcels. The amount of land which a man with one work animal (carabao or ox) can cultivate is about 1 hectare (2.5 acres). Any plot of land less than this may therefore be considered a small parcel. However, with the help of the whole family it is usually possible to cultivate a larger amount than this, the area depending on the number of active members in the family and varying from 1 hectare to 5 hectares (12 acres). Pieces of land over 5 hectares in area are nearly always worked entirely or in part by persons other than the immediate family of the owner. Chart XXIX shows graphically the portions of the Philippines in which each of these three sizes of parcels are most important.

It should be understood that there are parcels of land of all sizes everywhere in the Philippines. The map shows only the size of parcel into which most of the cultivated land of any given region is divided. The Philippine census of 1903 states that about half the parcels of occupied land are less than 1 hectare in area, and that a fifth of these are less than .01 hectare[1] (.025 acre). The average size of Philippine farms is given in the census as 3½ hectares (8½ acres), which means that parcels of less than 1 hectare predominate. Those of medium size (from 1 hectare to 5 hectares) are next in importance, while of the larger parcels (over 2 hectares) there are comparatively few.[2]

Most of the land in the province of Albay is in holdings which are from 1 hectare to 5 hectares in size. This province can therefore be taken as typical of the Philippines in general, and the following figures compiled by J. Q. A. Braden, Provincial Treasurer, may be considered averages for the Islands:

52.3%,	or	50,770 parcels, contain less than 1 hectare	52.3%
23.9%,	or	23,201 parcels, contain 1 hectare but less than 2 hectares	42.65%
10.55%,	or	10,242 parcels, contain 2 hectares but less than 3 hectares	
8.2%,	or	7,960 parcels, contain 3 hectares but less than 5 hectares	
3.5%,	or	3,300 parcels, contain 5 hectares but less than 10 hectares	5.05%
1.55%,	or	1,602 parcels, contain 10 hectares or more	
100%			100%

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[1] As the Philippines are a land of scattered holdings, the small plots mentioned are in the hands of a smaller number of owners than would at first be thought. The question of the distribution of land among the people is quite a different subject and is taken up under the heading Systems of Cultivation in this chapter.

[2] It will be noted that the map gives these data with reference to total area, while the census gives them in percentages of total number of holdings. Sizes of land parcels in France are much the same as in the Philippines. In the United States the average size of farm is 55 hectares (138 acres) and the average amount of improved land thereon is 30 hectares (75 acres).

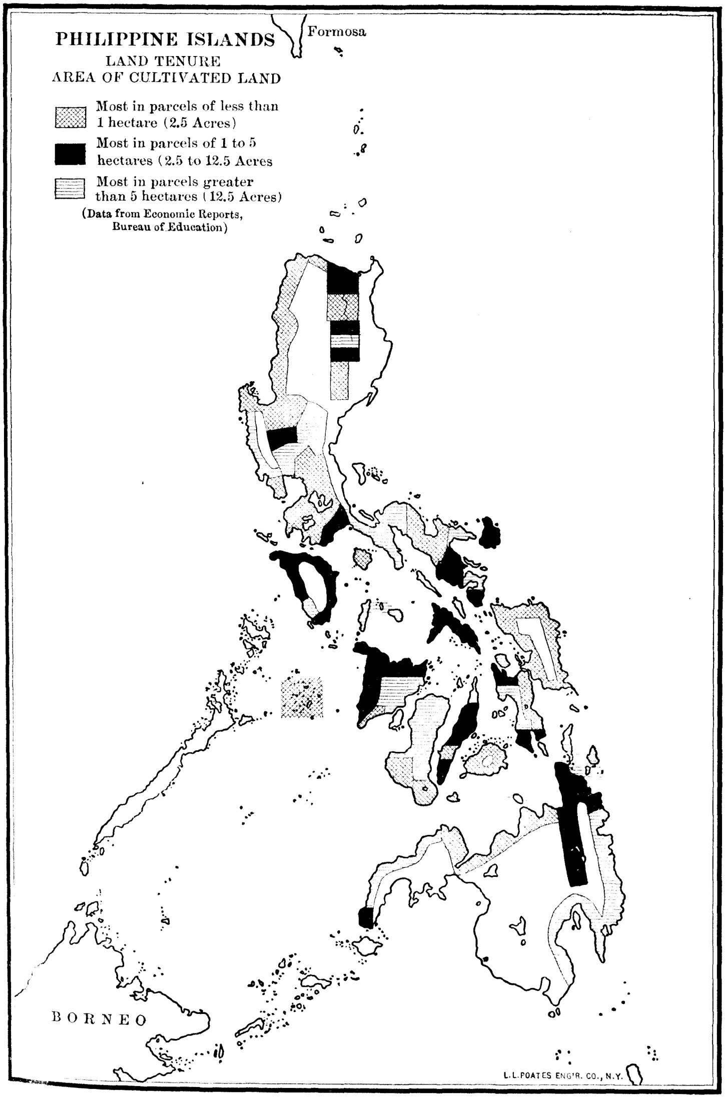
PHILIPPINE ISLANDS
LAND TENURE
AREA OF CULTIVATED LAND
Most in parcels of less than 1 hectare (2.5 Acres)
Most in parcels of 1 to 5 hectares (2.5 to 12.5 Acres
Most in parcels greater than 5 hectares (12.5 Acres)
(Data from Economic Reports, Bureau of Education)
Formosa
BORNEO
L. L. POATES ENG'R. CO., N. Y.

CHART XXIX. LAND TENURE—AREA OF CULTIVATED PLOTS

Ilocos Norte may be taken as an extreme example of the predominance of small holdings. As shown by the records of the provincial treasurer, 100,000 hectares of cultivated land are divided into 200,000 parcels, averaging $\frac{1}{2}$ hectare each. On the other hand, in parts of Negros and Iloilo 75 per cent of the land is in plots of over 10 hectares each.

The large parcels have in a few cases been handed down intact from early Philippine times. Many are the whole or parts of large Spanish land grants made from the public domain. Some estates have been formed gradually by purchase of contiguous smaller pieces. A few are greater than 1000 hectares (2500 acres), many are between 100 and 500 hectares (from 250 to 1250 acres), while most are less than 100 hectares. In none of the larger estates is the whole of the arable land cultivated.

FORMATION OF SMALL AND MEDIUM PLOTS

The fields of medium size and the small plots are the result of several conditions:

1. The method of lowland rice culture, which necessitates dividing the land by dikes, results in small plots. Level strips of small area, but of varying elevation, are made so that water from the canals will flow through the higher levels to the lower ones.

2. When land was plentiful and was owned by virtue of tenancy and use alone, the settler cleared and claimed only as much as he could cultivate. The plots of medium size resulted. The manner in which the Philippine Islands were originally occupied is illustrated by the procedure of Ilocano immigrants in settling new country. They come in groups of from five to twenty, each group under a headman, who takes possession of a certain amount of public land. When this is cleared and put in a state suitable for cultivation, it is divided among the immigrants by the headman. Quite often several families who wish to migrate intrust their savings to one of their number, who buys land for their new homes. This land

is distributed among all those constituting the community, but the title remains in the name of the headman.[1]

3. Large parcels of land have been broken up through inheritance. The parents apportion the parcel among the children, both male and female, and thus after several generations the plots become so small through division and redivision that it is impossible to further divide them. In this way it often happens that several persons will own an undivided interest in the same plot. In the more densely settled portions of the Ilocano country it is almost impossible to purchase even half a hectare of land that is not owned by from three to twelve persons.

4. It is with the greatest reluctance that the average Filipino parts with his land, but sometimes misfortune or need of cash, occasioned by funeral, marriage, or other family event of importance, compels him to sell or mortgage a part of it. This land is seldom redeemed. Sometimes, induced by high prices offered by the tenants, the larger holders are persuaded to sell small pieces of their land.

The feeling which prompts the tenant to buy a piece of land long held by himself or family, and which makes the owner so loth to part with inherited holdings, accounts for the persistence as well as for the growth of small plots. The property of the wife is kept separate from that of the husband. Every parcel is carefully divided among the heirs. Inherited property is so highly prized that owners do not care to sell it, even at three or four times what it is worth. Most landowners possess more than one small plot, yet it never occurs to them to sell several of their small parcels in order to buy adjacent property, although they might be able to obtain the latter at from one half to one third the original price.[2]

This desire for land (inborn, and the result of an aristocracy based on land ownership) is even now resulting in the extension of small holdings in most regions. It is true that in the most backward parts of the Islands the attitude of the people is such that the condition of land tenure remains unchanged. Moreover, in a few localities where large parcels predominate, large proprietors are increasing their holdings by buying those of the younger generation who prefer to sell and enter some other form of employment than agriculture, and those of the small proprietors who get into financial difficulties through ignorance or inability to handle their own affairs. But the Filipino share tenants are ambitious to own their plots and the small proprietors to acquire further holdings. In most cases they fail to do this through ignorance and inability to conduct their own affairs, but those who do succeed in establishing themselves as independent landowners and in extending their holdings are constantly increasing the number of small plots. This will be further discussed in considering the share tenant.

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[1] From the economic report of Fred O. Freemyer, Pangasinan.

[2] From the economic report for Laguna Province, submitted by R. G. McLeod, Division Superintendent.

SYSTEMS OF CULTIVATION

The rights of a person in a piece of land may change. They are not always complete; customs, inheritance, law, or contract may limit them to a term of years or to a certain amount of the product. These various rights will be best understood by a discussion of the systems by which land is cultivated.

The large parcels in the Philippines are cultivated by proprietary, share, or rent systems. The small parcels may be cultivated by the peasant proprietors or by hired labor, or may be leased for a definite amount of money or product, or on share of the crop.

THE PROPRIETARY SYSTEM

In the proprietary system the owner superintends the affairs of his estate directly or through managers; the laborers work for a wage and are supervised in small groups by foremen.

The Sugar Haciendas of Occidental Negros

The sugar haciendas of Occidental Negros offer the best example of the proprietary system, and will be discussed here. There are about 400 sugar haciendas in that province, the average amount of land cultivated on each varying from 100 hectares (250 acres) in some parts to 250 hectares (625 acres) in the San Carlos district. During the busy season an average of between 100 and 200 men are employed. Only about 25 per cent of these laborers reside permanently on the plantation, 75 per cent being brought in, usually under contract, from the island of Panay and from the Bantayan Islands during the milling season, which extends from October through March.

The contract which the laborer makes with the owner or his managers is usually a verbal one to work at a certain daily wage, the employer furnishing the transportation to his estate and advancing money to pay the laborer's indebtedness at his home or the necessary amount for the support of his family while he is absent. Sometimes this agreement is made with a foreman who has taken a labor contract to cut and haul all the cane in a field. In any case the men are worked in squads or groups of from 8 to 30, with one foreman for each group. The foreman directs and disciplines the laborers, but in some cases questions may be referred to the overseers or manager. Families often accompany the married men. The women and children do the lighter work about the farm and may even clean and plant the cane points.

The laborers usually live in villages grouped about the owner's house, the permanent laborers in houses, the temporary ones often in barrack-like structures which may be quite crowded during the milling season. The wages given are keep and money, varying from ₱0.20 to ₱0.60 per day, according to the locality and the demand for labor. Since laborers seldom work continuously, the average amount earned per week is only from ₱1 to ₱2. Most of this is spent in gambling at cards or in the cockpit, and some goes for clothing, food, and tubá; but the average workman always takes part of his wages home with him. The laborers receive food from the manager only while they are working. This consists of a ration of rice or corn with fish, usually dried;

occasionally, perhaps once a week, meat is included. As a rule the permanent laborers are better housed and fed than the temporary ones. They sometimes have garden plots and a few chickens and pigs.

The relation between planter and laborer is only the business one of employer and employee. The planter works his laborers so as to obtain the greatest possible results from their efforts. Most of the laborers, however, are drawn from the class which, largely from ignorance, desires to work as little as possible for their wage, and to obtain as many advances as the planters can be persuaded to make.

The planter is expected at any time to advance money to his tenants up to two months' salary, to furnish medicine and support the families during sickness, to get them out of trouble, to settle petty disputes and quarrels, and to give advice and counsel on all subjects. Custom generally concedes him the right to fine his men when necessary, to bring back men who have left owing him money, and to collect from the children the debt of a man who has died. The laborers do not leave for any action on the part of the planter if they think it just. The planter is deterred from abuse of these powers by fear of losing his laborers.

The difficulties of the labor situation in Negros are chiefly due to the fact that the laborers employed belong to the least intelligent classes of Filipinos, and that they are without any property or other interests which might give them the stability found among most Philippine agricultural laboring classes. Most of them are recruited from districts where sugar growing is practically unknown, and often they do not understand even the first rudiments of agriculture. The initial cost of bringing a laborer from Panay may amount to ₱20. If, therefore, he works only part of the time, — and he usually takes many lay-offs, — this amount of capital is lying idle. After pay day from 30 to 50 per cent of the men may be absent from their work. It thus becomes necessary to maintain a force of 100 men in order to have 60 working every day. The percentage of dishonest persons among the laborers is large, and on an average from 5 to 10 per cent "jump their contract" and leave the planter with only a debt in his possession. A planter of Negros annually loses in this manner from ₱50 to ₱1500, depending on the number of men employed and in some districts amounting to 10 per cent of the annual expenditure for labor.

However, the planters also are to blame for the unfortunate labor situation. Many of them do not give enough personal attention to their farms, and as a whole they are making little effort to better the condition of their laborers. There is lack of coöperation among planters who accept as laborers men known to have "jumped" debts with other employers. Then there has been little attempt to establish labor on a firmer basis by increasing the number of permanent laborers, providing small garden plots, and encouraging education. In general, planters have preferred to keep the men in debt, hoping thus to retain their services, and have not encouraged independent workers. It is noticeable that those few planters who provide good food and shelter for their laborers, who treat them well and encourage schools, have the least labor trouble and are even able to obtain locally all the help necessary. The adoption of modern methods would permit planters to keep a permanent labor force and do away altogether with the unsatisfactory migratory seasonal labor.[1]

The Proprietary System in Other Provinces

The haciendas of Oriental Negros are similar to those just discussed, but many of the peasant proprietors (who predominate in that province) are available as laborers during the rush season.[2]

The proportion of permanent laborers on the sugar haciendas is much greater in Iloilo than in Negros. All extra labor needed during the milling season can be obtained locally in Iloilo, and the labor troubles are of much less importance than in Negros.

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[1] Agricultural labor is discussed in Chapter XIII.

[2] Much of the information concerning the haciendas of Negros was derived from the reports of Eugene H. Rabun, C. A. Harbaugh, Martin S. Jones, and Roscoe L. Hall, supervising teachers.

Rice, corn, abaca, and sugar are produced on the haciendas of Leyte. Many laborers live permanently on the land, but a large number are also annually brought in from Cebu. Little difficulty is encountered with labor by planters of long experience. Great care is exercised in establishing the estates, and only good workers are allowed to settle on the farms, those who do poorly being weeded out. However, some trouble is had with transient laborers who leave owing money.

The abaca haciendas of the Bicol Peninsula are worked on a somewhat different plan, since abaca is usually stripped on shares. Most of the laborers live permanently on the hacienda, and these are often assigned a small patch of ground on which vegetables, bananas, and the like are grown. Tenants sometimes leave haciendas when the landlords try to discourage the maintenance of these plots. The wage of the stripper on share varies, with the amount of fiber he obtains and the market price, from one half to two thirds. In some places a ration valued at ₱0.10 for every arroba of hemp stripped is also given. The laborer's share must usually be sold to the owner of the land. Sometimes the owner furnishes fiesta during the year. The temporary laborers on an abaca plantation are few and are often better off than the permanent laborers since they have small parcels of their own. The foremen have the general supervision of the strippers, weigh the abaca, and the like. The laborer must often do the transporting of the clean fiber to the selling place. He also has to cut weeds from the fields and set out new plants. Laborers on the hacienda of Sorsogon "jump their contracts," but to a much less extent than in the Visayas. Another troublesome habit of the laborers is stealing and selling hemp. There is also a tendency among them to work a few days and loaf the rest of the time. This is particularly true where the people are not interested in garden plots or in small holdings.

In parts of the Cagayan Valley, particularly in Isabela Province, a mixed form of the proprietary share system is found. Tobacco is the staple crop. The laborers are assigned permanent plots and give one third of the tobacco crop as rent. They are supervised by foremen and usually sell their share to the owner of the land. In addition they obtain the entire product of the cornfields and receive from ₱0.25 to ₱0.40 a day for any other work not connected with their crop.

Forms of the proprietary system also exist in other provinces.

New Plantations

Many new haciendas have lately been established in the Philippines for the cultivation of abaca, sugar, rubber, coconuts, pineapples, and other crops. Around the Gulf of Davao are several abaca plantations which are cultivated by hired labor and stripped by share. Most of the labor is permanent, but a considerable portion is "floating." The largest sugar plantation in the Islands is that in Mindoro, on which modern methods are employed. The laborers have been brought in and settled permanently in villages. They are well treated and it is reported that but little difficulty is had with them. On the large sugar haciendas now being established in Laguna Province 35 per cent of the laborers at present live permanently on the land and 65 per cent are brought in from surrounding villages. They receive from ₱0.50 to ₱0.60 and keep per day. In general the new plantations are being worked on the proprietary system and with labor permanently established on the land.

PEASANT PROPRIETORS

In several sections of the Philippines the greater part of the land is tilled by the men who own it. Such localities are: (1) those in which there is much new land or in which much unoccupied land is found, as Nueva Vizcaya Province, parts of Isabela and Cagayan provinces, the lumbering regions of Bataan Province, parts of Tayabas Province, Butuan and Palawan provinces, parts of Moro Province; (2) regions long settled, in which the cultivation of the land by peasant proprietors results from the wide distribution of wealth. Such regions are parts of Tarlac, Pampanga, Laguna, Batangas, Cavite, and Camarines provinces; Albay, Sorsogon, and Antique provinces; parts of Capiz and Leyte provinces; Oriental Negros, Bohol, and Misamis provinces.

There are other regions in which the land is owned by the tillers of the soil. These are not given in Chart XXX, but a comparison of that chart with Chart XXIX will show them. They are Ilocos Norte, Ilocos Sur and Pangasinan provinces; much of Bulacan and Bataan provinces; parts of Rizal, Cavite, and Batangas provinces; parts of the Bicol provinces; and parts of Cebu and Leyte provinces. In these regions the interleasing system predominates (which see).

In all parts of the Islands there are also peasant proprietors who own and till a greater or less portion of the land.

The number of plots, their size, and the area of total holdings of peasant proprietors vary. In general the plots of larger size occur in the more recently settled regions or in those having much unoccupied land. In such districts the cultivator usually owns one plot, from 1 hectare to 5 hectares ($2\frac{1}{2}$ to 12 acres) in area according to the crop requirements of tobacco, rice, corn, sugar, coconuts, and abaca. In well-settled regions the peasant proprietor often owns several small plots, sometimes as many as ten or more, but about three on an average. The total area of these may be considerably less than is necessary to yield the proprietor a living, in which case he will lease more land on share; or it may be larger than he can cultivate, in which case he will let other persons cultivate some of the plots on share. Usually the plots of one owner are separated, often by several kilometers, so that peasant proprietors in general lose much time in going to and from their fields and spend much extra energy in keeping each little plot fenced, watered, and free from weeds.

The condition of the Philippine peasant proprietor is better than that of any other tiller of the soil in the Islands. His

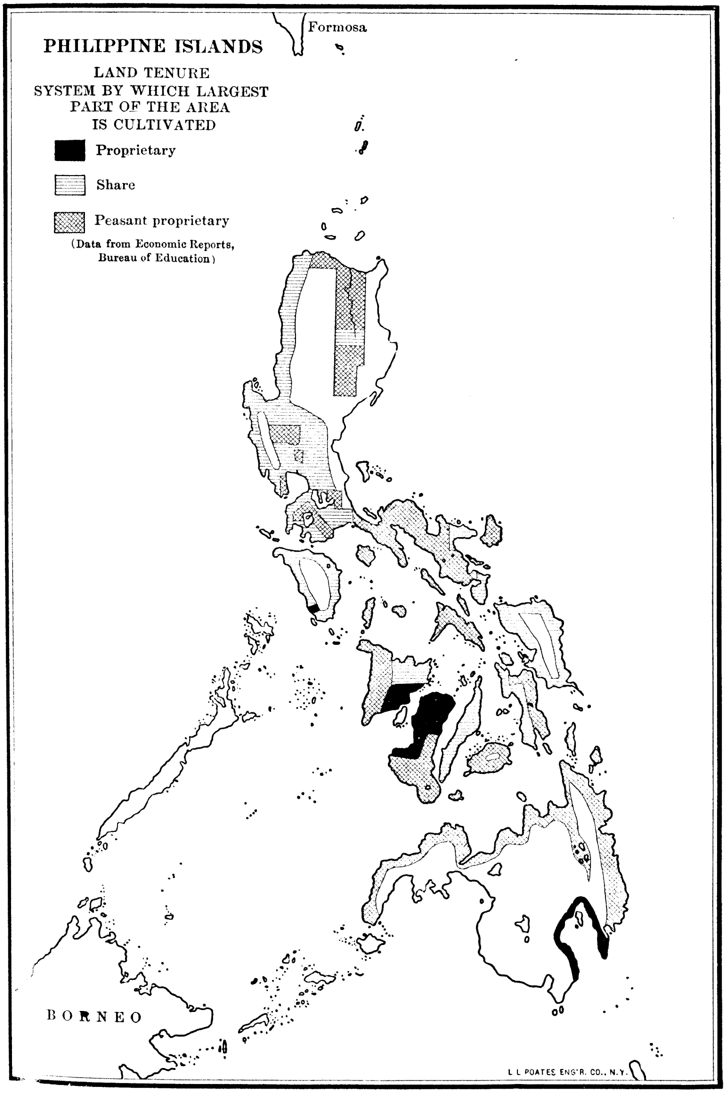
PHILIPPINE ISLANDS
LAND TENURE
SYSTEM BY WHICH LARGEST PART OF THE AREA IS CULTIVATED
■ Proprietary
▤ Share
▨ Peasant proprietary
(Data from Economic Reports, Bureau of Education)
Formosa
BORNEO
L L POATES ENG'R. CO., N.Y.

CHART XXX. LAND TENURE—SYSTEM BY WHICH LARGEST PART OF DIFFERENT AREAS IS CULTIVATED position has greater stability since he owns property which protects his creditors from loss. He is not often a habitual gambler or a permanent borrower. His intelligence is greater than that of hired or share laborers since his self-reliance and initiative are more developed. His income is greater because he obtains the total crop from the land he works. The total annual income of peasant proprietors expressed in pesos was estimated by the economic reports at from ₱100 to ₱500 with the average about ₱250. Nearly all this is spent for food, clothing, and shelter. In some sections the remainder is devoted to amusements and luxuries; in others it is habitually saved by the peasant proprietors. The Ilocanos save from 5 to 10 per cent of their annual income and invest it in work animals and land.

The income of the peasant proprietor is seldom wholly derived from agriculture. During the "off season" he may work on a neighboring hacienda in the sugar harvest, stripping abaca, or in the coconut groves. At rice harvest he and his family may reap rice on share. He may be a porter, driver, fisherman, lumberman, or wandering merchant. Often the women of the household greatly increase the family income by keeping small shops or by weaving cloths, hats, mats, baskets, slippers, and the like, or making pottery, embroidery, and other products in the home. Some of these products are used in the household, but most of them are sold.[1]

Small Owners who rent or cultivate with Hired Labor

In most parts of the Philippines few or no owners of small plots cultivate them with hired labor, but in the Visayas there are regions in which that system is common. Several thousand plots are cultivated by hired labor on Panay, Negros, Samar, Leyte, and Cebu islands. In Tayabas Province and the Bicol Peninsula hired labor is employed on small coconut and abaca holdings. Small owners also rent plots to cultivators.

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[1] See Chapter XVII, for a discussion of the relation between agriculture and household manufacture.

These men usually interest themselves in gainful occupations. Those that retain a few of their fields often work harder and cultivate them better than their tenants. Some occupy government positions or are employees of large companies; some are fishermen; some interest themselves in commerce and become storekeepers or wandering merchants; some are day laborers, especially on public works; others are carpenters or barbers; many are teachers; while among the Ilocanos and in Capiz Province and other places they often devote themselves entirely to handicraft work in the homes. However, some small owners are satisfied with the meager income they obtain from renting their plots or working them with hired labor and set themselves up as petty landlords. In a few regions these men and the small owners who lease their land on share constitute a large idle population.

THE RENT SYSTEM

In the proprietary and peasant proprietary systems the owners actually till the soil or supervise the work, and are the only ones directly interested in the crop. They have the whole right to the use of the soil since they own the land in fee simple.

Sometimes cultivators obtain a temporary right to the total product of the land by paying a stipulated sum of money or amount of product; that is, they rent the land outright. This system is one much practiced in Europe and the United States. In the Philippines it is employed to no great extent, though it is growing in favor in certain districts.[1]

In most provinces land is rented directly to the cultivator at prices ranging from ₱3 to ₱20 per hectare for rice soils. In

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[1] In Pampanga the large landowners rent tracts of considerable area to tenants, who in turn become landlords by subleasing the parcel to tenants. The rent in this case is usually money. (From the economic report submitted by Mrs. Lois Stewart Osborn.) In Iloilo sugar land is in some cases rented for cash at approximately ₱8 per hectare, this rental including the use of the mill and all the buildings on the land. Such large rented areas are worked by either the proprietary or the share system.

Isabela Province tobacco land rents for from ₱35 to ₱100 per hectare, depending upon the fertility of the soil, and whether carabaos are included.[1] The payment of a definite amount of palay at harvest time is an even more common form of rental, and ranges from 1 cavan to 12 cavans of palay per hectare (or the same numbers of cavans for every cavan planted). The amount of rent depends in any case upon the fertility of the soil and nearness to the village or town and is usually one third of the crop. The renter furnishes his own carabao. The rental system is found in Isabela Province, in the Central Plain of Luzon, and in Zambales, Rizal, Laguna, Batangas, Mindoro, Panay, and Leyte provinces. In Zambales rent in kind is the system most used, but the form of control by the landlord approaches that of the kasama system. In parts of Bulacan as high as 50 per cent,[2] and in Rizal Province in the zacate fields near Manila 25 per cent, of the land is rented outright. In Laguna it is known as the "Busian" system.[3] In this system the rent is a fixed charge against the renter. If the crop fails he is usually given possession of the land for another year, so that he may pay off the debt to the landlord. In Zambales advances of palay and money at high rates of interest are made as in the kasama system.

SHARE SYSTEMS

In the three systems just described the possessor of the land is the only person directly interested in the amount of the crop. A large part of the cultivated area of the Philippines is leased on share, by an arrangement in which the owner of the land and the tiller of the soil are different persons but are both directly interested in the size of the crop produced. In some regions and under certain circumstances the share tenants are comparatively free in action, in others they are to a greater or less extent under the direction and supervision of the landlord, not only in matters pertaining to the tilling of the soil, but in family and everyday affairs.

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[1] Reports of Walter K. Perret and Horatio Smith.

[2] From economic report of Fred T. Lawrence.

[3] Reports of M. M. Boney and R. G. McLeod.

The Manorial System

This system approaches that which existed in Europe at the time of the Spanish conquest of the Philippines.

We can best understand the mediaeval manor by picturing to ourselves the economic life of a whole village as a unit with the manor house its central point.[1]

The whole of the cultivated land then fell into two species: demesne land, land cultivated entirely for the benefit of the lord, which might consist of a separate enclosed portion, or of holdings scattered among the holdings of the villagers, or both; and land held in villeinage, that is, land held from the lord by his tenants, who were unfree, and were bound to pay certain services to the lord. The amount of land owned by each tenant, and the services due to the lord, depended on his status. Two main classes can be distinguished: the ordinary holding was a virgate or yardland, usually thirty acres (12 hectares), held in scattered strips; the holder of a virgate was called a villein. Next came the bordars or cotters, the general size of whose holding was one or two acres ($\frac{2}{5}$ to $\frac{4}{5}$ hectares) though it sometimes rose to five acres (2 hectares) or more. These did not possess either oxen or a plough, and were in a decidedly lower position than the villeins. Both villeins and cotters were unfree, but their position was not that of slaves; a slave is bound to his master; his servitude is personal, he is destitute of rights, he may be called on to do anything. . . . But the villeins and cotters were territorial serfs, bound to the land to perform certain fixed services, and they were not destitute of rights, in general opinion at any rate; how far these rights could be enforced by law was another matter.

Services were paid in labor on the lord's demesne, and out of the very great variety of them two main classes emerge: "week work," that is, labor for certain days a week regularly all the year round, villeins generally giving three days' work and cotters two; and "boon work," extra labor in addition to the week work at times of the year when there was special need for it; such boon work would be demanded at harvest, haymaking, and ploughing. In addition to week work and boon work there were often small tributes or payments in kind; fowls and eggs, bushels of oats, and so forth; and the villagers had to do

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[1] Buecher's "Industrial Evolution," p. 103.

> what cartage the lord required. These duties discharged, the tenant had the rest of his time to work on his own holding.
>
> It is evident that the principal task in managing an estate was to see that the villeins and other tenants paid their services duly, and to superintend them at their work. Such work when ill looked after would tend to be little, for the laborer had no inducement to work hard, and in the case of the boon work, the villein had every incentive to evade or put off fulfillment of his duty. . . . Whether an estate was valuable or not mainly depended on the amount of labor available. Fertility would be undeveloped, size would merely prove cumbrous, if there was a want of labor. There was no class of laborers who could be hired; a lord must depend on the services of his tenants. Thus pains were taken to keep up the labor on an estate. It was, generally speaking, impossible for a man on it to leave it; heavy fines were asked before permission was given. New holdings could easily be bestowed out of the waste, or existing ones divided if more land was required. But above all, when the aim of good management was that each manor should be self-sufficing, that the customary labor should be enough and no money disbursed to hire more, it was important to have an exact account of the labor on each estate. To know this was to know the value of the manor.[1]

The manorial system is most closely approached in parts of Mindanao. There the tenant has the use of a certain piece of land allotted to him by the owner. The product of the land is his own to do with as he likes. No rent is paid, but the tenant is obliged to work for the landlord a certain part of the time, for which he receives wages. It is the custom for the tenant to work every second week for the landlord. If the two have a disagreement, the landlord must purchase whatever permanent crops the tenant may have planted, before the latter leaves.[2] There are isolated cases of the landlord's receiving the entire crop from a certain part of the land cultivated by the tenant, the latter taking the crop from the remainder.

On certain haciendas on Negros Island part of the land is tilled by share tenants, who often have to work two days a week ("dagyao") for the landlord. Formerly this service was given without extra compensation but now daily wages are paid.[3]

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[1] George Townsend Warner's "Landmarks in English Industrial History."

[2] From the report of M. A. Maxey, Baganga District, Moro.

[3] From the report of H. E. Carmichael.

The Kasama Share System

The above two methods are very local in occurrence. In most cases land is leased on share of the crop. The regions in which the greatest area of the land is worked by share systems is shown on Chart XXX. In general the relation of the tenant to the landlord and the condition of both divide share systems into three kinds:

1. Large haciendas cultivated on the share system — the *kasama*, *kanan*, or *inquilino system.*
2. A large number of scattered plots owned by one person and leased to tenants — the *scattered holdings system.*
3. Leasing and re-leasing by peasant proprietors — the *interleasing system.*

The kasama system is found on nearly all the large holdings in the Central Plain of Luzon, in Zambales, and in the Cagayan Valley (see Charts XXIX and XXX). It is also found to some extent in most other parts of the Islands.

The owner of a large share estate may or may not give personal attention to his land. He may live on the farm and closely supervise the tenants, or he may live in town and interest himself in other things. In the latter case he may have a manager, who can be considered the landlord in this discussion, or his tenants may take care of themselves in a disorganized manner. It is only the supervised, or organized, estates that will be discussed here.

On most organized haciendas worked on the share system, the landlord has considerable jurisdiction over the affairs of the tenant. In all cases he determines the crop to be planted, the time of planting and harvesting, and such matters as pertain directly to the cultivation of the plot assigned to the tenant. The relation between landlord and tenant in private affairs depends largely upon the custom of the community, the character of the individual landlord, and the class to which the tenant belongs. The more closely the tenant resembles the laborer described in the proprietary system, the greater is the control of the landlord over his actions. In the kasama system as it exists in the Central Plain of Luzon, the landlord exercises his control most effectively and the tenant is correspondingly dependent.

A Typical Kasama System.[1] The owner furnishes the tenant with land, a carabao, and seed, the product of the crop to be equally divided between them after deducting the seed. Upon delivery to the tenant of the animal he takes "bugnos," advance money. This varies from ₱ 15 to ₱ 70 and forms a retainer, as it were, until the owner sees fit to release him and his family. The money itself he generally spends for his womenkind, and the balance at the cock-pit, which is his natural depravity, but his only pleasure in a life of hopeless drudgery. Naturally, as he lives from hand to mouth, he is absolutely without resources, except cooking-pots, a mat or so, and a few clothes. At the end of the week, usually on Sunday, he draws a ration of palay from the owner, which varies, though usually one half cavan per week is sufficient for his family. This amount he pays back in kind with no increase, upon gathering his crop. But all other supplies of money that are generally drawn from time to time from the owner are paid for in "takalanan": that is, that at the end of the season the tenant repays the landlord in palay at less than market value, say, at from ₱0.50 to ₱0.75 per cavan, a gain to the owner of from 150 to 200 per cent.

When the land, for the proper and timely preparation of which the tenant is held rigidly responsible, is once prepared the seed rice or other crop is distributed in the fields awaiting transplanting. This part of the work is sometimes paid in total by the owner, the tenant doing the harvesting at his own expense; but the general custom is for the owner and tenant to pay halves, the tenant naturally taking the money from the owner, paying the same rate of interest as the "takalanan," which swells his debt. The planters receive commonly from ₱0.15 to ₱0.25 a day with rations, and if the tenant has in his family any one who can plan rice, he naturally reduces the price of his share of the planting.

The crop once planted, the ration of palay is usually discontinued, but the family has to exist, so a new schedule is put into force, that of "terkiaan," 50 per cent increase, or "takipan," 100 per cent increase, so that if a tenant receives 5 cavans between planting and harvest he must pay back $7\frac{1}{2}$ if "terkiaan," or 10 cavans under "takipan." After standing in February, threshing commences, usually with carabao or cattle. The winnowing of the grain is generally done by the tenant's womenkind, who receive 4 per cent for their work. The crop is now ready for division; first the seed is deducted and the crop is halved; out of the tenant's half is deducted for the owner his total amount taken in rations, his "takalanan" and "takipan." Generally all he has left is an increased debt and the 4 per cent received by the women for winnowing; however, he manages to exist until the cropping commences again, when he resumes his ration and debt.

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[1] This is an extract from an unpublished report, "Circle for the Study of Social and Economic Conditions in the Philippines," a synopsis of notes on the kasama system as found in Nueva Ecija, by Percy A. Hill, issued by the Committee on the Prosecution of Investigation and Publication, Manila, 1909. Mr. Hill is a planter in Nueva Ecija.

Upon large farms and haciendas years often pass without a "patuid," or settlement, and the tenant never knows whether he owes ₱50 or ₱100; thus, practically not only his work is demanded but that of his wife and children until they are old enough to enter as tenants, or until death passes the debt on to the younger generation. Their lives are a continual round of work and drudgery, the owner generally finding something to be done at all times.

The tenant's food consists of rice and vegetables, which he raises himself, generally camotes, corn, beans, and greens, varied by fish caught in the rice fields during the wet months and by an occasional piece of meat. Upon this meager diet he works day in and day out, his only pleasure being tobacco and an occasional drink of "bino." As a rule he uses two suits of clothes and one hat per year, a total value of about ₱5. A large family usually swells the debt. If he gets despondent, he has his former owner transfer him and his debt to another. He owns no land, nor property, as a rule, and his house is a "cubo" or hut of light materials, put together in two or three days. Of course his condition often varies. An old "kasama" often lives as well and as content as the owner, and at the present time an increasing number are acquiring animals of their own and hunting up homesteads or leased lands, but many who obtain an animal fall into debt again.

The average taken by and charged against a tenant and family of three persons, estimated from observation and experience, are as follows:

Plow, and other implements	3.50 cavans of palay
Ration, ½ cavan weekly, May 1 to September 30	10.00 cavans of palay
Supplies, tobacco, salt, etc.	6.00 cavans of palay
Money received at ₱0.50 per cavan, ₱12.00 (used for oil, meat, clothes, matches, etc.)	24.00 cavans of palay
Terkiaan, October 1 to November 15, 3 cavans	4.50 cavans of palay
	48.00 cavans
"Bugnos" (advance money)	₱20.00

A good average crop for a tenant is 100 cavans; his share of one half (50 cavans) less 48 cavans leaves him 2 cavans to pay on interest of the ₱20 advance money. Therefore as a rule ₱100 is sufficient to support a family of three for a year, valuing palay at ₱2 per cavan. If corn, beans, or peas are raised, one half goes to the owner after deducting the seed, but only a small amount of secondary crop is grown.

The owner exercises a power over the tenant that would be difficult to define. He is consulted on all affairs of ways and means and even marriage, absence from the land, use of animals, extra day or night work. In petty lawsuits the tenant must obtain permission to participate; otherwise he pays for loss of time at an enormous rate.

The dense ignorance of the tenant often leads him to be imposed upon by his more astute fellows and landlords, but on the other hand he exasperatingly celebrates every fiesta in the calendar, and without careful watching will lose in a month by carelessness the crop it took him six months to produce. Yet he cheerfully submits to working out debts which are sometimes held only by verbal promises, often over a period of years, and once entirely out of debt, he usually manages to fall into another before he realizes it. It is to the natural advantage of the owners to secure and keep the tenants in a constant state of debt.

In general, conditions on large estates worked by the share system approach those just described.

Number of plots leased. The amount of rice, tobacco, or corn land leased to the tenant in an organized-share hacienda varies with the locality and particularly with the richness of the soil, but is usually one or two hectares. The amount of land given a tenant for sugar and abaca plantations is larger than for tobacco or rice, and varies from two to five hectares in plots separated or contiguous. It is seldom that more than one plot is leased, although on an hacienda where both rice and corn are grown, a tenant may have one lowland and one highland plot. When the landlord has both rice, and corn and tobacco lands, two plots are sometimes taken as these crops are grown at different periods of the year. A house plot in the village either goes with the leasehold or is rented at a small sum per year.

Permanency of tenants. The agreement between tenant and landlord is sometimes, but not generally, written and is most often for one season. Usually it is indefinite in nature.

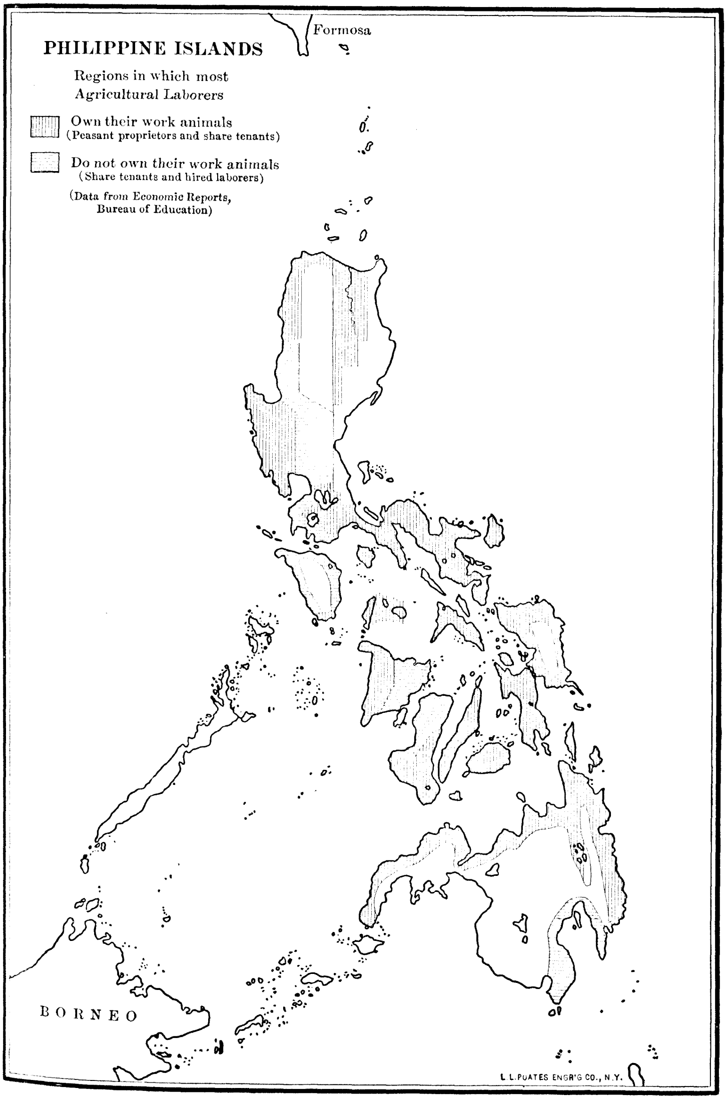
PHILIPPINE ISLANDS
Regions in which most
Agricultural Laborers
▥ Own their work animals
(Peasant proprietors and share tenants)
☐ Do not own their work animals
(Share tenants and hired laborers)
(Data from Economic Reports,
Bureau of Education)
Formosa
BORNEO
L. L. POATES ENGR'G CO., N.Y.

CHART XXXI

If the landlord is kind and the tenant efficient, the lease continues. If the tenant does not please the landlord, he is ejected, and if in turn he is not pleased he may leave. In some places there are landlords who cannot get tenants in the locality but have to go to other towns each year to secure them.

Division of the crop. The share of the crop credited each of the three factors which produce it, varies according to the custom of the locality, the fertility of the soil, the proximity to the town or market, and a variety of other conditions. However, the apportionment is usually based on a valuation of one third for the labor, one third for the work animal, and one third for the improved land. The division of crop therefore depends upon who owns the carabao. If the tenant possesses a carabao, he gets two thirds of the rice crop and the landlord one third; in other cases the owner usually gets two thirds and the tenant one third of the crop. It seldom happens on a large share estate that a third party owns the work animal. By consulting Chart XXXI it will be seen that most of the tenants on estates in the Cagayan Valley and in Zambales Province own their animals, while those on estates in the western part of the Central Plain of Luzon do not. In the Visayas most tenants on large share estates are furnished their animals by the owners. In some places tenants harvest and thresh the crop; in others this is done for a separate consideration, and additional harvesters are often employed on share of the product.

There are many variations in the above general division of the crop, all of which cannot be given here; the most important are mentioned, however. When rice land is exceedingly fertile the owner may receive one half the crop instead of one third, and if it is not very fertile or is far from the village (as upland fields) his share may be one fourth or even less. In Occidental Negros the landlord furnishes land, seed, and animal. The lessee does all the work until harvest. One eighth the crop is given to the harvesters, and of the remainder two thirds goes to the landlord and one third to the lessee.

If the former furnishes the land only, he takes but one third. In some places an exact division of the crop is made under the first arrangement. In Bataan Province the landlord plants the crop, advances ₱30 per hectare without interest, and cuts the crop. The tenant does all the other work, gathers the crop after it has been cut, and delivers the landlord's share at his home. In this case the crop is divided into two equal parts. If the landlord furnishes the land, carabao, and seed, and pays for extra labor in transplanting, he receives three fifths, the harvesters one fifth, and the tenant one fifth.

In Bataan the landlord on a sugar estate furnishes seed, fencing, and milling, and feeds the mill laborers. The tenant of a small plot does all the planting and cultivating, feeds and pays extra field laborers, hauls the cane to the mill and sugar to the market, and receives half the product. If the mill belongs to still another man, he furnishes the necessary labor for it, and the sugar produced is divided equally among the three parties.[1]

On abaca plantations the division is one third or one half unless the price of the fiber is low, and then the laborer obtains the greater share. It should be noted, however, that the third factor, the animal, does not enter into the production of abaca. Neither is the animal considered on a coconut plantation. In Laguna Province the tenant takes care of the grove, keeps out beetles, reports damage, and collects the nuts for counting. A number of nuts sufficient to pay the cost of picking and transporting are removed by the owner, and the tenant receives one fifth of the remainder. In southern Luzon and on the Visayan Islands, half the copra produced is given the tenant when the latter does the work outlined above and also prepares and dries the meat. In Tayabas the landlord gets two thirds of the copra, but has to build and maintain the drying kiln and provide the tenant with a house in the village which he may occupy when he wishes.

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[1] In parts of Negros fully 60 per cent of the hacienda owners have men renting sugar lands from them under the *parcero* system. The *parcero* owns from 1 carabao to 25 carabaos and leases approximately 2 hectares of land for each work animal. He furnishes all animals, labor, and field machinery, but is often financed by the planter, who lends him money at 15 per cent interest with his work animal and standing crop as security. The harvested cane is turned over to the planter who takes 50 per cent of it as rent for the land. The planter also charges ₱2 for each picul of the *parcero's* sugar for grinding the cane and boiling and transporting the sugar to Iloilo. When the whole hacienda is leased, the lessee does all the work and turns half the sugar over to the owner of the land and mill. In this form of lease the land is not worked by the *parcero* himself but is cultivated by the proprietary system.

Usually a part of the natural increase of domestic animals placed in the tenant's care becomes his property. By this custom a tenant frequently secures a carabao, which advances his economic condition considerably.

Mutual rights and duties of landlords and tenants. The mutual rights and duties of the landlord and tenant differ in various parts of the Islands. The tendency is to relieve the tenant of all duties except those directly connected with the piece of land leased. Yet it is still customary in most regions for the landlord to call upon tenants for group labor at harvest time, to repair and build houses, fences, ditches, mills, etc., and to get wood and run errands. The custom of making small presents of farm or handicraft products to the landlord is still practised by the tenants in some places, but is rapidly disappearing. No wages are paid for extra work unless it is of long duration, and then a money wage is often given. Otherwise gifts from the landlord and, in case of group work, fiestas are supposed to recompense the tenants. The tenant's family, however, nearly always receives a daily wage when working for the landlord. The more services the tenant renders the landlord the more likely he is to receive substantial advances of food and money, and the more lenient is the landlord's treatment of him. Formerly tenants had to keep the landlord supplied with wood, but this duty is now required in but few regions; they also threshed his rice, but with the introduction of threshing machines such duties are constantly growing less numerous.

The landlord may provide a tenant with a fiesta for a variety of reasons. He generally does this when he is the beneficiary of group labor. Sometimes he gives fiestas at stated periods; for instance, after the harvest or, less frequently, after planting. He often supplies music or other amusements at the yearly village fiesta.

Control of the landlord over tenants. The control which the landlord exercises over the private affairs of the tenants varies greatly in different parts of the Islands. He usually defends them in court and against other persons in matters that pertain solely to the crop, and often looks after their private interests before the law. He does this to keep the tenants contented so that they will remain on his estate. They are to a large extent dependent on him, and look upon him as their leader and director in times of emergency. He arbitrates their quarrels and gives them advice and the benefit of his close supervision.

A very important consideration in the share system, particularly on rice haciendas, is the question of advances and interests. Conditions in Nueva Ecija have already been quoted. For the Islands as a whole interest on such advances ranges from 50 to 500 per cent per year. When a debt is paid in kind, the landlord often takes produce at a lower rate than the market price, for instance, ₱0.50 per cavan below the market price for palay when it is selling at from ₱1.75 to ₱2.25 per cavan. The landlord makes a further profit by holding the rice until July or August, when the price rises to ₱2.25 or ₱2.75. At this time tenants frequently buy back at an advanced price the same amount of palay that they parted with at the end of the harvest, thus contracting another debt which must be paid at the next harvest, and so on from year to year. Most advances are paid in kind. In sugar, too, the landlord buys the tenant's share at a low market price and holds it for a higher price, thus making a large profit.

It is through advances, interest, and debt that the planter often controls the actions of his tenants and holds them to the land. Serfdom for debt was an ancient institution in the Philippines, and to-day Filipinos feel that honor compels the payment of a debt as soon as possible, and that a debt of a father attaches itself to the succeeding generation. Ignorant tenants therefore consider themselves legally bound to the landlord by debt and, in any case, feel in honor bound to repay their debts as best they can. Hence it is that a tenant thrown out of a share estate because of his refusal to pay such debts loses his reputation not only with the landlord but also with the tenant class. By the law of custom he becomes an outcast. The ejected tenant, who has broken his contract or refused to cultivate the land, must usually leave the district. The landlord thus feels it to be to his interest to keep the tenant in debt and, as a high rate of interest is charged on advances, he usually manages to keep all of the tenant's share covered. A tenant is thereby virtually working for his keep and a little spending money. There are landlords who encourage tenants to get out of debt and acquire work animals and land, but these are the exception, and there are even some who will refuse to accept payment of a debt in order to keep the tenant on the land.

In the most backward parts of the Islands the landlord has practically absolute control over the tenants, but the more enlightened the community, the less is the power of the landlord. Where labor is scarce and there is considerable wealth generally distributed, the balance of power may be in the hands of the laborers.

The landlord on large organized share estates always determines the kind and amount of crop to be planted and the time of planting and harvest. Tenants must obtain permission to raise crops other than that so determined, to raise stock for their personal use, and, if in debt to the landlord, to sell their portion of the crop. Tenants nearly always carry out the orders of the landlord with respect to the tilling of the soil. Cases are known, however, where the tenant did not cultivate all the land he leased and consequently the crop was smaller than it should have been; but the landlord claimed and received as his share the amount of palay which he would have obtained had all the land been cultivated. Sickness, however, is usually considered an acceptable reason for the production of a partial crop.

As previously stated the tenant for the most part remains permanently on the farm. Sometimes another person who wants the tenant will persuade him to change and will advance the money to pay off his debts to the landlord, thus in turn assuming them. When the landlord is dissatisfied he may tell the tenant to get the necessary money to pay his debt, in which case the tenant finds another landlord to assume it. When the landlord sells his land his rights in the debts of the tenant are sold with it. In a few cases a tenant will leave the landlord owing debts. Here the latter has no recourse, though sometimes custom obliges any landholder who accepts a tenant to assume his debts to the former landlord. In case of the death of the tenant his children usually assume the debt. If they are old enough they work it out on the land, and young children often come to serve in the house of the landlord at a stated wage until the debt is paid. This is the foundation of the bonded debtor system discussed in Chapter XIII. It is seldom that the children repudiate the debt of their father; the unity of the Filipino family is very great, and moreover failure to assume such debts might result in the children's being ostracized by their associates.

In most cases where the tenant is mistreated by the landlord he simply leaves the estate. Both tenant and landlord have the right to take any matters involving breach of contract, mistreatment, or injustice to the courts, but neither often avails himself of this privilege. However, instances seem to be multiplying as the tenants are beginning to understand better their rights before the law.

The ownership of a work animal or of a small plot of land, or both, gives greater stability to the tenant, secures him better treatment and terms from the landlord, and is more satisfactory to the latter. Sometimes the tenant gives the landlord a guaranty of some sort; this may be a title to a small plot of ground, or another person may stand responsible for his debt. In some places legal contracts are made, and debt or damages due the landlord can be obtained from the sale of tenants' property. Such "tenants at will" are, of course, much better off and much more independent than those previously described.

Income of tenants. The income of the tenant on a large share hacienda may vary from ₱80 to ₱200; the average is probably ₱100. In general this class of tenants save but little: most of the income is expended for food, a little for clothing and luxuries, and the remainder in gambling. The largest incomes are, of course, obtained by those men owning carabaos.

Summary. In general the relationship of father and child may describe the attitude of landlord and tenant to each other. The landlord is paternal, the tenant filial. Nevertheless both look out for their own interests — the landlord to get as much out of the tenant as he can, to keep him indebted and contented so that he will not leave; the tenant to obtain as many advances as he can and work as little as possible. The landlord regards the tenant as a natural and easy means of getting his land worked. The tenant looks upon the landlord as a business benefactor. Their condition and the real feeling of each to the other depend upon the disposition and enlightenment of the landlord, and the state of ignorance of the tenant and his willingness to work. In most cases the tenant must depend on the landlord. Often he is unable to plan his career alone and looks to the landlord for direction in the most trivial matters. The latter usually encourages this dependence and stands in a paternal attitude toward his tenant. The tenants generally respect and love the landlord: he is godfather to their children, and perhaps his father was their godfather. The landlord appreciates the work of good tenants and encourages them to increase their output. At times unscrupulous landlords overburden their tenants, some even requiring of the lessees services which they have no right to demand. On the other hand, lessees left to themselves neglect their duties and often cause the landlord much inconvenience. The landlord is not always gently paternal, but may be domineering, arrogant, and selfish, and the tenant, on the other hand, is often so extremely ignorant, lazy, shiftless, and fickle that it is impossible to utilize him as a producing agent unless some system of compulsion is maintained.

In the more advanced regions of the Philippines the tenants are beginning to learn something of their personal legal rights in their relations with their landlords. Those landlords that have been somewhat overbearing in the past are being deserted by their tenants. The confidential relation is in some cases becoming less close, and in a few regions considerable trouble is experienced with tenants who leave without making a settlement.

Scattered Holdings Share System

The scattered holdings system is found in those regions in which all or part of the land is divided into small and medium-sized parcels. Such holdings do not permit of the hacienda system (either proprietary or share) even when owned by a few rich families. Leo J. Grove, Supervising Teacher, has estimated that the total cultivated area of Camiling, Tarlac Province, is about 16,000 hectares divided into 15,000 parcels. Subtracting a third of the parcels and 1000 hectares allowed for building lots, it will be seen that the average parcel is about 1½ hectares. About half of these parcels are owned by people who have from 5 to 30 scattered plots, and do not work their own land.

Where such holdings exist, it is a common practice of lessees to take more than one plot, and these are usually widely separated. They aggregate in area the amount of land ordinarily leased by a tenant under the kasama system. The lessees try to get adjacent plots, but on account of the peculiar method by which these are owned (explained in this chapter under the heading Size of Parcels) it is not often that such plots are available. For instance, in the coast towns of Albay it is quite common for a man to rent one plot on the mainland and one on an adjacent island. The owners of parcels of land which are not large enough to support the family often cultivate other plots on share.

The systems of division of the crop are much the same as those discussed under the kasama system. However, a few others exist. Sometimes, as often occurs in Samar, the work animal is owned by a third party who receives one third of the crop. On the small sugar plots where the landlord provides a very primitive mill the tenant usually gets two thirds of the sugar produced but furnishes all the labor. In abaca production the landlord sometimes pays a premium over the usual share if the lessee materially improves the production. In the cultivation of intensive crops which require no animal, such as betel in Pasay near Manila, the crop is equally divided between both parties. Sometimes the owner of a small piece of land borrows money on it and gives the lender full possession and rights to its use until this is returned. The interest takes the form of the product of the land and may net the lender from 40 to 80 per cent. The owner gets back the land whenever the money is returned. In the usual contract for sale made in the Philippines a stated time is set when the borrower loses the land if the money is not returned. In the system noted above, however, the contract extends indefinitely.

Under this system the tenant often brings virgin land under cultivation for the use of the plot for a certain period of years or for a certain amount of the cleared and planted land. On coconut lands in Oriental Negros the tenant sometimes receives all that he can raise between the palms he sets out. He must care for the young trees, and when they are too old to permit cultivation between them he receives from ₱0.10 to ₱0.20 for each one. In Cavite he is given a fourth of the land after having been able to cultivate between the trees for four or five years. In Mindoro and other places where land is plentiful the tenant receives half the land. In Sorsogon the tenant clears the forest, plants a garden plot with corn and sweet potatoes for himself, and sets out abaca for the landlord. In three years the abaca is ready to strip. From the first three strippings the tenant receives the entire product, and then — about 4½ years from the planting — the ordinary division is made. When the tenant clears rice land, constructs the necessary irrigation canals, and brings the plots into cultivation, he receives as his payment the crop for from one to five years in Pangasinan Province, and for about three years in Sorsogon.[1]

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[1] These are excellent examples of rent in the economic sense of the word. The rent for the productive powers of rice land in Sorsogon Province is, for each crop, one third the labor of clearing the land, draining, and diking it, $\left(\frac{\text{labor on land}}{3}\right)$. The word "rent" has two meanings, one popular, the other scientific. So far, the word "rent" has been used in the popular sense and refers to the sum paid for the use of the productive powers of the land as well as of the improvements thereon, such as fences, irrigation ditches, freedom from stones, and the like. The rent for a given plot of land increases with the value of these improvements and decreases with the exhaustion of the soil (productive powers). The scientific meaning of the word "rent" is limited to a consideration of the productive powers of the land, and in the following discussion of the law of rent (taken from Laughlin's "Elements of Political Economy") should be so understood:

"Lands are of varying degrees of productiveness. They vary not only in their power of producing different articles, such, for example, as wheat and tobacco, but they do not all produce the same thing equally well. . . . The slope, drainage, constituents of the soil, vary from field to field even in the same farm, so that some lands afford a large return to labor and capital, while others do not; the former are superior, and the latter are inferior soils as regards fertility.

"Two pieces of land, which are of equal fertility, as regards their natural productiveness, might also be so affected by situation that one would be classed as superior and the other as inferior. Suppose that one piece, A, were situated near a railway station, and another, B, twenty-five miles away from any market, and that each parcel of land produced one hundred bushels of wheat. In the case of B, the value of ten bushels might be spent in carrying the produce to the station near which A was situated. The farmer of B would be no better off than if he cultivated land close by A which produced but ninety bushels. The cost of transportation enters into the outlay of producing wheat on B, so that although equal in natural productiveness, B is really inferior to A by situation; consequently we may speak of superior and inferior lands, although this difference of grades may be due solely to situation. . . .

"When different grades of land are in cultivation at the same time (producing the same article), the cultivator of the richer soil receiving the same

The services which the tenant performs for the landlord in the scattered holdings system are much fewer than those in the kasama system. The custom of requiring services is fast passing away. In general, too, the condition of the tenant is much better under this régime than under the kasama system. Many possess one or more carabaos or are the owners of small plots of land, and the landlord can obtain from the sale of these any sums due him. In some localities, indeed, the landlords will seldom advance much money unless the tenant owns some property.

The financial and general condition of the tenant under this system is much better than his condition on large estates. The income varies from ₱100 to ₱400 and averages probably ₱200. Additional income is obtained from other sources than the plot he rents, just as peasant proprietors obtain additional income. The following is an estimated income:

Farming		
Rice	₱100	
Sugar	100	
Mango trees	20	₱220
Fishing		10
Wages as carpenter		25
Earnings of wife and daughter as hat or mat weavers, etc.		25
		₱280

In general, it can be stated that since, under this system, the holdings and tenants are scattered, the landlord cannot

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price per bushel as the cultivator of the poorer soil, the former will get more for his work . . . than the latter. The same labor . . . produces on the rich land more bushels per acre than it does on the poorer land; and, as the price at which each bushel is sold is the same, the return to the former . . . is greater than the return to the latter . . . although they are equal in both cases. This surplus of the value of the product of the richer over the poorer land, when both are needed for cultivation, is rent; and the whole of it goes, under free competition, to the landlord or owner of the land.

"This law accounts for the range of rents per hectare mentioned under the Rent System, and also for the varying parts of the crop which are given the landlord in the share system."

exercise the same control over his tenants that he does in the kasama system. Moreover, the tenants usually belong to a more intelligent class of laborers, and in the majority of cases own a work animal and often small plots of ground. These give stability and a sense of responsibility not possessed by the tenants on the large hacienda. Landlord and tenants usually get along well, the landlord looking upon his lessees as poor relatives (which they often are) for whom he is somewhat responsible, and being recognized by the tenants as a superior personage. Sometimes the tenant is entirely independent of the landlord except in matters directly concerned with the soil.

It is therefore evident that the tenant under this system is in a much better condition than the tenant under the kasama system. His income is greater and he is much more independent of the landlord. Indeed, he may rent from two landlords.

Interleasing Share System

In Ilocos Norte and parts of Ilocos Sur 90 per cent of the tillers of the soil own land. Yet 80 per cent of the land is worked on the share system. Here the landowners lease their more distant parcels and in turn become tenants on more conveniently situated plots on the same or even less remunerative terms. The parts of the Philippines in which nearly all or much of the land is cultivated under the interleasing system are, as is stated on page 184, Ilocos Norte and Ilocos Sur and Pangasinan provinces; much of Bulacan and Bataan provinces; parts of Rizal, Cavite, and Batangas provinces; parts of the Bicol provinces; and parts of Cebu and Leyte provinces. Since the interleasing system is carried out by peasant proprietors merely to lessen the disadvantage of widely scattered plots, it may well be linked with the peasant proprietary system. When these two systems are considered together, it may safely be said that the greater number of the small holdings in the Philippines are cultivated by peasant proprietors.

GENERAL COMPARISON

Proportions of Tenures and Classes of Cultivators

Probably 90 per cent of the land in the Philippines is cultivated either by peasant proprietors or on share. Considering the dual rôle played by many tillers of the soil it is probably safe to say that 45 per cent of the land is cultivated by peasant proprietors and 45 per cent by tenants. Hired labor is used on most of the remaining 10 per cent of the land. The amount of land rented outright is small.[1]

Factors which are changing the Proportions

In many places the proportions of classes are changing; in general the peasant proprietors are increasing, being recruited from the tenant class. This results from (1) the tenant's obtaining a carabao as his half of the natural increase of the animals under his care; (2) the increase of household industries and other "outside" activities; (3) a greater intelligence.

In a few places, as in Iloilo, large holdings are increasing, because (1) the small holders are not able to take care of their own interests and therefore lose their land; and (2) the children of small owners educated in the schools are no longer contented with the meager living, and are entering other pursuits in which they can earn more. This results in a small increase in the proprietary and share systems in a few localities.

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[1] The following comparisons are interesting:

In Bulgaria there are less than 100 agricultural properties of over 100 hectares (250 acres), and out of 700,000 odd families of the nation, 550,000 own their own farms. The democracy and strength of this country have recently been shown in the Balkan-Turkish war (the *Outlook*, February 8, 1913).

According to the census of 1910, 62.1 per cent of the farmers in the United States are owners, less than 1 per cent are managers, and 37 per cent are tenants. Of the tenants, two thirds are rent tenants who pay a stated amount (usually cash) per acre of land rented, and one third (or about 12 per cent of all farmers) are share tenants. The average parcel of cultivated land is 30 hectares (75 acres).

In France the properties of peasant proprietors cover a large part of the soil and are increasing.

In Mexico there are districts in which peasant proprietors predominate, yet much of the land is cultivated under the advance and debt share system.

As has already been stated, in nearly all parts of the Philippines the tillers of the soil are desirous of improving their condition by acquiring work animals and land. In some places the number who make this attempt is small; in others it includes nearly all the cultivators who have the opportunity. Probably certain islands in the Visayas are the most backward in this respect, while the Ilocanos are the most active. The custom which gives to the tenant a part of the natural increase of animals in his care is often a help to independent proprietorship. Ilocano tenants in general and tenants of various towns in other parts of the Philippines accumulate enough through outside work and through household industries to purchase a carabao and even the land upon which they live (see discussion of household industries, Chapter XVII). In Laguna Province the landlord often furnishes the land and seed and sells a carabao to the tenant on credit without interest, although if payment is made in produce there is the usual discrepancy between market price and the price credited to the tenant.

Throughout the Islands the larger number of tenants who attempt to provide themselves with carabaos and land fail. As soon as they become independent and are deprived of the benefit of supervision by the landlord, they relapse into indolence, devote themselves to gambling, or commit indiscretions, and soon lose their possessions. Their inability to manage their own affairs is against them. Often their attempt is premature, because they have to borrow money to pay for the animal or land, and the high rate of interest charged on sums borrowed soon results in the loss of animal and holdings. Sometimes the former tenant and his family will get along well until death or marriage occasions a fiesta, at which time all accumulation and possessions are spent.

In spite of these conditions, however, the peasant proprietors are almost everywhere increasing in relative importance.

Condition of the Classes of Cultivators

It would appear that the greater the percentage of large holdings in a town the poorer is the condition of the laboring class. The hired laborer and the poorer tenant are illiterate; their knowledge seldom extends outside the hacienda; they have no initiative or idea of responsibility; their attitude toward the landlord is subservient; they lack stability; they are poorly clothed, fed, and housed, and in fact simply exist. The public schools have not drawn as large a proportion of pupils from this class as from other laboring classes. More farm work is expected of the children, and they are not encouraged to go to school.

Tenants as a class are usually poor, but their livelihood is assured; their food, housing, and clothing is better than that of hired laborers; they are usually ignorant and in debt on account of the high rate of interest, but they receive the protection of the landlord and his advice. Their assumption of responsibility is greater than that of hired laborers, and as a class they accumulate more. Even if he owns nothing, the tenant's interest in a share of the crop gives him a certain stability, and it is only where this is taken away by action of the landlord who appropriates all the crop above the bare necessities of the tenant and holds him in debt, that his condition is reduced to that of the day laborer. The income of the tenant having a carabao or land is larger than that of the simple tenant; his position is the most stable of the tenant classes.

In the most backward regions of the Philippines the peasant proprietor classes are very ignorant and often not very industrious. Sometimes they are really tenants on share, since their land is controlled, through debt, by the landlord class. Such proprietors are little better, if as well off, as the average tenants on share.

If possessed of a false pride on account of ownership of land, the peasant proprietor has no inclination to exert himself and does not supplement his income with the proceeds of outside labor. The difference in the individuality of peasant proprietors is especially noticeable when industrious peoples like Boholanos or Ilocanos settle among an indolent population.

The peasant proprietor usually has some education; he can get money at a lower rate of interest (though still usurious) than the tenant; he builds a better house and has better food and clothing; he usually prides himself on the ownership of animals, a granary of palay, rice, or corn, and a small amount of land; he is anxious to give his children the advantages of education; and his social pleasures are much greater than those of either the tenant or the hired laborer. In general, the peasant proprietor lacks the advantage of supervision by better educated men, and he is liable not to get as much out of the land as he might. He stands some chance of losing his possessions by quarrels in court, crop failures, or other misfortunes. On the other hand, his greater interest in the crop more than offsets the decrease due to lack of supervision by the landlord, and he often grows a far greater variety of crops than does the tenant. To sum up, the peasant proprietor is hard working, but lacks the elementary education and business thrift to provide for emergencies.

Condition of the Landlord Classes

In considering the landlord classes we include only those who own large estates, either proprietary or share. Many are careless in their farming, trusting rather to luck than to good management, and therefore many haciendas are heavily encumbered with debt.

The average landlord feels that the proprietary or tenant system is the only one which will succeed with the class of men with whom he has to deal. He may even oppose the effort of tenants to better their condition and become independent, because he feels that he is being deprived of labor.

In general the landlord class in the Philippines has no appreciation of modern methods and does not give enough attention to the land. Systems of accounts are needed, as well as carefully worked out farm systems, and a greater knowledge of farming and business is required. Encouragement of greater efficiency in laborers through general education, fair treatment, and just reward, and the use of modern methods give better results in agriculture than the advance and debt system at high rates of interest such as now obtains on nearly all large Philippine estates. This advance and debt system seems at first sight advantageous to the landlord in that he receives a large rate of interest and is able to hold his tenants. It is really, however, disadvantageous to him, since it compels him to invest all his money in agriculture. Were the hired laborers and the tenants independent of these advances, the landlord classes could invest their money in other enterprises and increase general business activity in the Philippines.

Encouragement of an Agricultural Middle Class

So far as the Islands in general are concerned, the peasant proprietor is the best citizen because of his stability and his sense of responsibility. Few of the tillers of the soil in the Philippines get out of the land anywhere near what it should produce; nevertheless it is probable that the peasant proprietor, although lacking supervision of the landlord, produces more than other agricultural laborers. But more than this, the independent tiller of the soil is the best citizen; a man who owns something for the government to protect takes a greater personal interest in that government. It is notable that the lawless elements with which the Philippines have at times been harassed have not originated where peasant proprietors predominate. The peasant proprietary system has disadvantages. In the cultivation of export crops such as sugar and tobacco and, to a less extent, abaca and copra, the hacienda system is often the best, since the tillers of the soil when left to themselves frequently produce a low-grade article and are at the mercy of the middlemen. In such cases agricultural progress may be hampered; for instance, at the present time it would be impossible for peasant proprietors to improve the methods of producing sugar as is being done on the large sugar haciendas. When food crops are raised, however, the peasant proprietor, as consumer, is directly interested in not only the amount but also the quality of the crop.

The government recognizes the desirability of an independent agricultural middle class, that is, a class between the hired laborer and the landlord, for independent citizenship is always the basis of democracy. The homestead laws, the activity looking toward the settling of land titles, and the agitation for lower rates of interest, all have in view the extension and protection of the peasant proprietary class.

PUBLIC LAND AND HOMESTEADS

In order to obtain title to a piece of public land in the Philippines certain government regulations must be carried out and certain sums paid. The mere settlement and tillage of the land does not give title. There are three methods in the Philippines whereby public land may be owned or controlled by an individual. (1) A plot of 16 hectares (40 acres) of unreserved, unappropriated public land which is not more valuable for mining or forestry can be taken as a homestead. The person taking up this land must reside upon it for a period of two years immediately preceding the date of filing his final proof, cultivating and improving it for five years, and must pay ₱10 at the beginning and at the end of the term. The fees may be paid in installments of ₱4 each. (2) A plot of 16 hectares of public land which has not been surveyed under either the Spanish or American rule can be purchased by an individual. While it is not necessary for him to reside on the land, he must cultivate it for five years before he can obtain a full title. (3) Public lands are also leased to individuals, corporations, or companies in parcels of not more than 1024 hectares (2400 acres) for a period of twenty-five years with privilege of renewing the lease for another twenty-five years.[1]

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[1] "Primer containing Questions and Answers on the Public Land-laws in force in the Philippines"; also Act 1864 of the Philippine Legislature.

The amount of public land in the Philippines is very large, yet the results obtained from the homestead law have been unsatisfactory. In the year 1912 only 2789 homesteads were taken, the largest in a number of years and almost double that for the previous fiscal year. Of the applications filed five years before, 5 per cent of the applicants did not cultivate any of the land applied for, and 50 per cent were not complying with the law relative to residence. The average area cultivated was 4 hectares. The Filipinos often become squatters on land in preference to taking up a homestead. In some places landlords oppose homesteading by the tenant class. In certain regions most of the public land is in the highlands, and the people prefer to lease land in the lowlands, where they can grow irrigated rice. Undoubtedly the building of roads into the interior of certain islands will increase the number of homestead applications there. Lack of animals has in many instances reduced the number of applicants; in general, also, the village system has kept a hold on the tenant, who has preferred to live with his relatives rather than establish himself alone at some distance from the barrio. With the exception of a few peoples such as the Ilocanos and the Boholanos, the pioneer spirit has been lacking among the Filipinos.

LAND TITLES

Throughout the Philippines much of the land, both large and small parcels, is held by people who have no documentary title to it. In most cases their titles can be proved. In many cases large tracts are in dispute between two or more parties, or homesteaders have filed on them, or squatters have taken possession, claiming them as public land. In a few instances this situation has produced a very chaotic condition. The laws of the Philippines allow individuals to prove their ownership of pieces of land in courts of land registration and to obtain legal registered "Torrens" titles. In time all parcels of land will be legally registered, and agriculture will be placed on a much firmer basis than it now is.

INTEREST RATES

The exorbitant interest charges in agriculture which now obtain in the Philippines have been noted in this chapter. The necessity of reducing these is evident, and the reduction will result in agriculturists' attempting to establish themselves as independent peasant proprietors. This matter and the question of government agricultural and private banks are discussed in Chapter XVIII on Exchange.

CACIQUISM

It is evident that the ignorance of the agricultural classes, their lack of initiative, and their inability to care for themselves, together with the ancient custom of loans, high interest rates, and honor connected with debt, place considerable power in the hands of large landowners and persons of intelligence. The possessor of such power is called a cacique in the Philippines. The control which the cacique may exercise over his tenants or even over peasant proprietors has been discussed at length in this chapter, and applies not only to agricultural affairs but to everyday private and public matters. Often so complete is the control of the cacique that he can use his power to his own advantage and to the detriment of the tillers of the soil. It is such abuse that has attracted odium to the word. During the last ten years the power of this class of men has waned with the increase of education and the greater initiative and independence of the people.

This question is a delicate one, but will probably be solved in time by the education of the masses, both in and out of the schools. Great care must be taken, of course, that the laborer, while given a knowledge of his rights and a desire for better things, is not at the same time deprived of his present ideas of the honor of paying obligations. This might result in as bad a condition as that on the haciendas of Negros. Laborers who are not capable of becoming peasant proprietors must be taught to feel the force of moral obligation, if the power of the landlord through time-honored custom is removed. As they become aware of their rights, laborers must acquire a corresponding sense of responsibility. That the present system of public instruction will finally do away with "one-man power" there can be little doubt. The following extract from the report of the Director of Education, 1912, is of interest in this connection.

> The aims of instruction in the lower grades of the public schools are to enable the pupil to understand, read, and write simple English; to give him a sufficient knowledge of figures so that he can later protect his own interests in minor business dealings; and to provide him with a limited fund of information on the subjects of geography, sanitation and hygiene, government, and standards of right conduct.

CHAPTER XIII

AGRICULTURAL LABOR[1]

The fact that nearly all labor in the Philippines is at present agricultural and that the problems concerning it differ from those pertaining to labor engaged in manufacture and commerce, warrants the consideration of agricultural labor separately.

Statistics on occupations in the Philippines are often misleading on account of the fact that the same individual frequently pursues more than one occupation. Agriculture is nearly always the chief employment[2] but the income of almost all Philippine agriculturists is considerably augmented during the off-season and in spare time by fishing, trading, weaving, driving, and such employments.

PHILIPPINE VILLAGE LABOR

The provinces of the Philippines are divided politically into townships, and these again into barrios with the *centro de poblacion* as the center. In most regions the people of the barrios are grouped into villages (*sitios*), consisting of clusters of from five to several hundred houses. In only a few places do the people live in isolated houses on the land they cultivate.

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[1] In the economic sense of the word, labor is any physical or mental action which produces wealth. It includes not only manual labor but also that of supervision and direction. In the popular sense, however, the word does not include the effort of supervision and direction. In this chapter the word is so used, and refers to peasant proprietors, tenants for rent, and share and hired laborers.

[2] In the United States secondary production is not common; in the East and in parts of Europe it is quite general. In Germany 12 per cent of persons engaged in agriculture, forestry, stock-raising, or fishing have a second or third occupation (Buecher).

The founding of these villages can often be accounted for by economic reasons,[1] but political and social considerations have been even more potent. The persistence of villages has economic, political, and social significance.

It is supposed that the Malayan peoples came to the Philippines in boats called "barangayes," under the command of a captain or pilot. The land in a settlement was apportioned among the families and all continued to live under the direction of the chief.[2] These little communities were held together by the need of mutual protection against the depredations of neighboring villagers. After the conquest, the Spaniards built upon this system. They concentrated the people in villages in order to Christianize them and make their government easier, and also to protect them from bands which had not "come under the bells" and from the Mohammedan Moros of Mindanao and Sulu. A cause for the concentration of people in rice regions is that the flooded fields are not good places for houses, which are consequently clustered together on higher land.[3]

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[1] See Chapter X.

[2] Compare with the discussion of Ilocano immigration on page 176.

[3] The result of inter-village warfare in the Mountain Province is thus described by C. R. Moss, Division Superintendent:

> Igorot villages have been located in easily defendable spots on account of feuds with neighboring people. The superstition of the Igorots in their primitive state is such as to lead to a ceaseless condition of strife between neighbors.
>
> The practice of head hunting is a part of the religion of most wild Igorots. A head is taken from a village, and the people of that village, in order to appease the spirits, are bound to secure a head from the offenders. The duty of collecting this so-called "debt of life" falls first on the relatives of the beheaded person, and is never forgotten.
>
> Such a state of affairs naturally leads to open rupture between villages, and of course, since a village is likely to be attacked, it is advantageous that it be located in a place which is easily defendable.
>
> In the northern sub-provinces of the Mountain Province, under the vigorous rule of the provincial authorities, the practice of head hunting is being exterminated, but this attempt is so recent that thus far there has been very little migration from the old villages. On the other hand, in the southern sub-provinces heads have not been taken for about two generations, and all the towns are at peace with each other. As a result the villages are generally smaller than those of the wild peoples, and in their location agricultural advantages have been considered rather than facilities for defense. Their present tendency is to break up into smaller groups and form new villages in places suitable for agricultural work.

Similar agricultural village communities also exist in Java.[1] The land surrounding them is often undivided communal land used by all the members of the village. Sometimes it is periodically divided among the people. Some lands have fixed divisions and are subject to periodic assignment.

Certain public services must be rendered to the community or to the headman, which were originally a burden upon the land rather than upon the individual. One might express this best by saying that each person enjoying the use of a portion of the village domain paid his rent in personal services to the village. These services consist in building and maintaining roads, bridges, irrigation ditches, markets, cemeteries, watchhouses, and other public works; in guarding dikes and ditches in time of flood; in watch duty; and in certain personal services to the village headman, such as cultivating his ground, caring for his horses, bringing fuel, repairing his house and sheds, cleaning his grounds, and accompanying his wife to market. All these services are assigned and regulated by the headman or village chiefs, and usually may be bought off, like the road tax in America, for a fixed amount.

When the Spaniards came to the Philippines, they probably found some such system as this in the villages. A modified form of this system still persists on the island of Cagayancillo, in the Visayas, in Sulu, and among the Moros. It is approached in an organization reported, by Fred O. Freemyer, to exist among Ilocano immigrants in Pangasinan.

From four to twelve families come together. The houses are built within a common enclosure and the land they farm is either owned or rented in common. If owned, the title is usually in the name of the headman who assigns to each one his share. If rented, the contract is usually signed by the headman only. During the planting and the harvesting season the families work in common but at other times each is given a particular part of the field to oversee. Such work as house-building and the digging of irrigation canals is usually performed in common, the one for whom the others are working being expected to provide a small feast with perhaps "basi" or "nipa vino." In case some members of the community do not own carabaos or other work animals, they are allowed to count two days' work as equal to one day's work of a man with a carabao. They are usually very fair with each other in their dealings.

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[1] See *Bulletin No. 58*, Bureau of Labor, Washington, D.C.

These are the only instances known to the writer where communal land tenure is approached among Filipinos. If it once existed it has now disappeared. Group labor, however, is still found in villages. Filipinos have been opposed to free group labor on public works, because they were so often made the victims of irregular official exactions. Nevertheless, in the last few years group labor has been used in the construction of schoolhouses, churches, bridges, and even for the building of roads. Group labor for the benefit of the individuals of a village is still widely practiced, though it is becoming of less importance. In a few districts it is not practiced at all.

Buecher in his "Industrial Evolution" divides labor in common — group work — into three kinds: (1) companionship or fraternal labor; (2) labor aggregation; and (3) joint labor.

> Companionship or fraternal labor occurs when several workers come together and labor without the individual becoming in the progress of his task in any way dependent upon the others. . . . The sole aim in union is to have the company of fellow-workmen, to be able to talk, joke, and sing with them, and to avoid solitary work alone with one's thoughts.
>
> The student whose work thrives best in undisturbed solitude will on hearing this probably shrug his sympathetic shoulders in pitying contempt, and find the subject hardly worth serious consideration. But anyone who has ever observed a group of village women braking flax, or doing their washing at the brookside, or watched a troop of Saxon field-workers hoeing turnips, or a line of reapers at work, or listened to the singing of a group of house painters, or of women at work in an Italian vineyard, will be of a different opinion. The lower the stage of a man's culture the more difficult it is for him to stick to continuous and regular labor, if he is to be left by himself.
>
> Thus fraternal labor accords very well with the economic principle, even though it originates primarily in the social instinct. In the company of others people work with greater persistence than they would alone, and in general because of the rivalry, also better. Work becomes pleasure, and the final result is an advance in production.
>
> By labor aggregation we mean the engaging of several workmen of similar capacity in the performance of a united task, . . . too heavy for the strength of one person. . . . Labor aggregation is of special importance for seasonal work or for work that is dependent upon the weather. . . .

> These circumstances have early led to a species of social organization of aggregated labor, founded on the duty recognized the world over of mutual assistance among neighbors. We may use the expression current among the southern Slavs and call it bidden labor. Whenever anyone has work to be done for which his own household is not adequate, the assistance of the neighbors is sought. They give it at the time without further reward than their entertainment, which the head of the house offers in the accustomed way, solely in the expectation that when need arises they, too, will be aided by their neighbors. The work is carried out in sprightly competition amid jokes and song, and at night there is often added a dance or like merry-making. . . .
>
> We come now to the last kind of labor in common, which we have designated joint labor. Certain tasks in production require for their performance the simultaneous coöperation of various classes of labor. . . . Since they cannot possibly be performed by one workman, several workmen of various kinds must be combined in one group to form an organized and indivisible whole.
>
> Instances from agriculture are quite numerous. Thus in drawing in hay or corn, the load-builder, the pitcher, the after-raker, in binding, the binder and the gatherer, form natural groups; in mowing grain a second person is required to glean, in digging potatoes another gathers them up.

In the Philippines labor in common is often performed with the understanding that the beneficiary will work in a like manner for each member of the group — plowing and planting fields in rotation, for instance, and harvesting the crops. The beneficiary of an unusual piece of work, such as house-building, recompenses the laborers by providing for them meals of extra quality and quantity, and by amusements. Such a time is made the occasion of a fiesta.

In the Philippines labor in common is often placed upon a permanent basis of reciprocity into which the elements of lottery, insurance, and banking enter.[1] The most common form is in connection with many of the village economic activities, such as making kaingin; plowing, planting, harvesting, threshing, and husking; building houses; making hats; in fact, doing any work which the member who gets the "turn" wants done. These "turnuhans," for such we shall call them, are not regular associations with formal rules and regulations. They are simply spontaneous associations of persons with a common aim to help each other, and different places have different practices in regard to details. In the town of Cavinti, Laguna, for example, help is given to one of the members once a week. Those who fail to help must work alone some other day, or give an equivalent in money, namely, ₱0.50. The man who was expected to work with a carabao must pay ₱1.50 in lieu of service. This payment of money in place of service is a modern development, as shown by the fact that in the original "suyuan" to pay money is considered a breach of good manners, for the word "suyo" means favor, and to pay for a favor is, of course, improper.[1]

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[1] The data on this subject were turned over to Conrado Benitez, Instructor in Economics in the University of the Philippines, who prepared this discussion. Reports on the "turnuhan" of Majayjay, Laguna Province, by Getulio Vitasa, and on those of Cavinte, Laguna Province, by Petronio Perez, deserve special mention here.

In some towns where hats are made the women help each other. Sometimes the materials are supplied by the members themselves; in other cases the one for whom the finished hats are intended supplies them. There is always a fixed minimum number of hats to be made by each member, and any one failing to contribute this number pays their value in money.

In regard to food for members during the work, practices again differ. In some organizations members furnish their own food; in others, they are fed by the beneficiary.[2]

[1] Again, this idea that it is improper to receive money for a favor survives even to-day among the servants (not the modernized ones who have seized upon the idea of a "tip"), who, ashamed to take money from the family guests ordinarily, do so when told that it is for cigarettes or buyo. In fact, to-day when tipping it is good manners to say "for tobacco or buyo."

[2] Group labor, as originally found in the labor turnuhan, has recently shown an interesting development in the provinces of Tayabas and Laguna, where money turnuhans are being established. The money turnuhan is an association run according to by-laws subscribed to by the members. These require a contribution of money at regular intervals, usually every Sunday, the sum collected to be given to one of the members chosen by lot. The turnuhan runs until every member has drawn the prize. A successful member cannot draw again.

Another common form of group labor in the Philippines is in connection with social activities, as distinguished from the economic activities mentioned above. These activities partake of the nature of mutual insurance in the help rendered the members of the community. Help is given at baptisms, weddings, and burials. In the case of funerals the work involved is the making of the coffin and the preparation of the food for the friends. As long as a person does the slightest bit of work, he is considered to have given his "abuloy" or "ambang." Help, moreover, may take the form

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The turnuhans are run in about the same way everywhere, for the constitutions adopted in different towns are mere copies of the original from Lucban, Tayabas. The number of members ranges from 25 to 500, the usual number being between 25 and 50. One exists in Majayjay which has 1000 members, but these are divided into five sections of 200 each, and each section is run like an independent organization. The management is ordinarily in the hands of a director, but for the larger turnuhans there are three officers — the director, the secretary-treasurer, and the inspector. The amount of individual fees ranges from ₱0.20 to ₱1.00 weekly. The number of years that a turnuhan runs depends on its size. From one to five years is the usual time limit, but some turnuhans must run nineteen years before all the members can get their money back.

The manager is granted special privileges for his services. In many turnuhans he receives the first drawing. In all of them the winner pays a certain percentage of his prize (from 1 to 2 per cent) for the expenses of management. The turnuhans make provisions for their protection. Members failing to pay their dues after a certain number of weeks lose all that they have paid in, and the money thus collected is distributed among the members at the end. If a member dies, his share is usually given to his heir, who continues to pay the dues. In some cases the deceased's share is turned over to the turnuhan. Members who have drawn the prize are not paid the full amount due them; some turnuhans retain three fifths of it as security against noncontinuance of payment. Others simply require two bondsmen before the whole sum is given the winner. A feature of life insurance present in one of the turnuhans requires that the lot must be given to the member who has suffered a great misfortune, such as death in the family.

Where money turnuhans are well managed they have proved to be beneficial to the community, for they have encouraged the habit of saving. They have furnished the members with ready capital, which is reported to have been invested in productive enterprises, such as the buying of carabaos and the planting of more lands. Others have used their capital in repairing their houses, and still others have been able to pay their debts with it.

The labor turnuhan keeps the members working, and nearly always results in some permanent improvement such as rice fields, houses, and the like.

of money or of goods, the latter usually being eatables for the many guests. The amount of money or of goods given varies with the individual.

The courtship of a woman is frequently the cause of many forms of group labor, and the activity that results therefrom may be classed as economic. A group of young men may decide to help the woman in husking rice. Here we have the beginning of a socializing activity, for usually the person helped prepares something to eat, and everybody has a merry time, especially when there is music and singing to keep time with the pounding.

An interesting form of group labor in connection with either death or marriage is that performed by young men. If any member dies or marries, the others contribute a sum of money previously agreed upon. Besides the money, they give commodities, such as wood for fuel, and render service at the feast, such as getting water and waiting on the table. Any member who fails to fulfill the requirement is fined by being charged double the regular contribution, and the fine must be paid within one week after either the funeral or the wedding, as the case may be. The members, in every instance, are supposed to furnish the transportation required.

Still another form of group labor in the village is the banding together of citizens for protection against fire and robbers. This was common during the Spanish administration and is still found in its original form in many towns. One has but to recall the frequent Moro raids in the past to realize the necessity which formerly existed for this kind of group labor. The private night patrol, or "ronda," used to be a common feature of Philippine life, and is said to exist still in some towns. There the adult male citizens take turns in performing this watch duty. Volunteer fire associations are now provided for by law.

In comparison with the system of isolated farms scattered over the country, as found in Cuba and Porto Rico (countries possessing similar products and economic advancement), the Philippine village system has points both for and against it.

1. It permits of group work. This, however, may not always be beneficial since it does not promote individualism and independence in Filipino agriculturists.

2. New thoughts and ideas are more easily promulgated, and news travels more quickly.

3. Children can reach their schools more easily.

However, much can be said against the village system.

1. Time is lost in going from the home in the barrio to the fields. This may amount to several hours daily. In many places this disadvantage is partly overcome by a temporary shack built at the field during the planting or harvest season.

2. The sanitary problem is always an important one where people are congregated.

3. In the scattered-farm system there is less temptation to fritter away time in social intercourse, in the cockpit, and the like.

4. The production of supplementary farm products (poultry, eggs, fruit, etc.) is greater on scattered farms.

5. In villages the danger from fire is great.

Philippine agricultural villages are gradually being broken up and the scattered-farm system adopted. There are certain districts in the Islands in which the village system has never existed, at least not for centuries. Two small regions of scattered farms are found in Tarlac Province. The coconut regions of Laguna and Tayabas are chiefly settled in that manner. Scattered farms predominate in Marinduque, Oriental Negros, Bohol, and a part of Cebu. The Carcar-Barili district of Cebu is probably the largest single region. It seems that the village system was not established here by the Spanish government because the people could easily be protected and controlled. It is now densely settled and the distance from house to house is slight.

The village system persists in the Philippines largely because of custom, the gregarious nature of the people, and ties of relationship. The family and clan feeling is very strong, as can be seen in the grouping of students from the same town at provincial capitals and at Manila. The Filipino family joins even the relatives who have moved to a great distance in a sort of family feudalism. It is obliged to look after all its members and to provide charity such as is dispensed by organizations in industrial countries.

In the outlying parts of the Islands and in regions, such as the Ilocano provinces, in which the land is divided into small scattered plots tilled by peasant proprietors under the inter-leasing system, the village system holds its own. In other places scattered farms are gradually increasing with the establishment of greater security. New settlers are building houses on their farms, and there is a gradual movement away from the villages along newly constructed roads.

EFFICIENCY OF LABOR

Efficiency of labor depends upon (1) inherited strength and characteristics, (2) standard of living, and (3) education and training. In preceding chapters (and particularly in Chapter XI) the methods by which advance in agriculture will result in larger production per hectare are discussed. In this chapter the question of larger production per man is considered.

INHERITED STRENGTH AND CHARACTERISTICS

His physical, mental, and moral qualities all affect the amount of wealth produced by the laborer, and these depend largely on inheritance and training in early childhood. It is a significant fact that the child usually follows the occupation of his father, and on this account is expert in his particular kind of work. This is especially true of production requiring considerable skill. For instance, it used to be said that a good cutter of velvet was only produced in the second or third generation. The Filipino is especially strong in the shoulders and can lift and carry better than he can perform other unskilled labor. He also shows great dexterity in handicraft, the fineness and evenness of which excite the admiration of all who see it. In Hawaii, where peoples of all nationalities have been gathered as laborers, Filipinos are considered especially good for light work; on heavy work most of them are not satisfactory. They seem to be slower than the Japanese.

That many of the physical disabilities of the Filipinos are due to the same causes which produce the high rate of infant mortality in the Philippines, there can be no doubt. If a child is born weak and is poorly nourished during the first few months of its life, it will not grow into a strong man or woman. The death rate per thousand in Manila during the year 1909 was as follows:

Spaniards	12.05
Americans	13.27
Other Occidentals	14.32
Chinese	16.64
Filipinos	47.65

This excessive death rate among the Filipino population is due to the high mortality of children, 65 per cent of the deaths being of children under five years of age, and 49 per cent, of infants under one year of age. The following table is a comparison of the infant mortality in Manila with that in the United States and France:

	PER CENT OF TOTAL DEATHS
United States	18.28
France	20.
Manila	48.8

In France and the United States the greatest mortality is among children that are artificially fed; in Munich, Germany, 85 per cent, and in Berlin 91 per cent, of the infant mortality occurred in artificially fed children. The opposite is true in the Philippines, where 74 per cent of the total infant mortality occurs among children who are nursed by the mother. Eighty-seven per cent of the infants dying of beriberi and convulsions (malnutrition) in Manila are nursed by their mothers. This means that the improvement of the physical condition of the Filipino mother is a very important economic question, not only in order to reduce the infant mortality but also to increase the physical strength of children that live. This can best be accomplished by reducing poverty and providing sufficient and suitable food. If good, pure cow's milk can be provided, great improvement will result. The splendid work done by the Gota de Leche Society in Manila shows what can be accomplished by scientific feeding of infants with pure milk.[1]

THE STANDARD OF LIVING

While his start in life has an important effect on the physical and mental efficiency of the laborer, the standard of living he maintains is of much more importance. As has been stated, on the plantations in the Hawaiian Islands it is noticeable that Filipino laborers are at first incapable of doing heavy work, and few are employed on heavy loading contracts. However, with change of food and methods of living they are gradually taking their places in all parts of the plantation, even, to some extent, in the mills, where the heaviest work is done.

Food

The chief uses of food are (1) to form the material of the body and repair its wastes, (2) to furnish the energy for the work that the body has to do, and (3) to yield heat to keep the body warm. The proteid foods are the principal tissue formers, and make the framework of the body. They are also burned up in the body like the carbohydrates, and thus render important service as fuel. Fats and carbohydrates are the chief fuel ingredients of food. Sugar and the starch of sweet potatoes and rice are burned in the body to yield heat and power. The fats, such as the fat of meat and butter, serve the same purpose, only they are a more concentrated fuel than the carbohydrates. The different nutrients can, to a greater or less extent, do one another's work. If the body has not enough of one kind of fuel it can use another. But, while the proteid can be burned in the place of fats and carbohydrates, neither of the latter can take the place of the proteids in building and repairing the tissues. Proteid occurs most abundantly in animal foods — meat, fish, eggs, and dairy products — and in dried legumes such as beans and peas. Butter and lard are the chief animal fats, and coconut, olive, and cotton seed, the most important vegetable oils. The most common edible nuts also contain considerable fat. The carbohydrates, unlike the fats, are almost entirely absent from the animal foods, except milk, but form the most important nutrient of most vegetable foods.[1]

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[1] Data from annual reports of the Director of Health, Manila.

In the arctic regions, where heat is of prime importance, fat, blubber, and fish are eaten almost exclusively. The inhabitants of the temperate regions are accustomed to a mixed diet of meat, fish, and vegetable matter, the amount of the former depending on the wealth of the people and the density of population. In the tropics the diet is largely vegetal, with considerable fish and a small amount of meat. The kind of food must necessarily depend on the vegetable and animal life available. Along the coast fish is eaten; in the interior less fish is obtainable, and beans and such vegetable foods high in proteids are often substituted.

Besides foods producing energy and tissues, the body requires certain quantities of mineral substances, especially salt, lime, and phosphorus. All peoples use narcotics and stimulants, not as nourishment to the body but for their effect on the nervous system. Such are spices, alcoholic liquors, drinks from beverage crops, tobacco, buyo, and opium.

The domestic vegetable foods which form a part of the Philippine diet have already been fully discussed in the chapters on food crops. The problems with respect to these are: (1) to increase the local rice crops so as to make the Philippines less dependent on the foreign food supply; (2) to increase the yield and use of corn as the chief food or one supplementary to rice; (3) through bean crops to provide another source of proteid, which is now obtained almost entirely from fish and meat; (4) to increase the amount of food in those sections in which restricted diet annually occurs; (5) to give greater variety to the Philippine diet in all directions possible, and especially in the amount of fresh fruits and vegetables consumed.

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[1] W. O. Atwater, in *Farmers' Bulletin No. 142*, United States Department of Agriculture.

Proper amounts of fish and meats may also provide the necessary proteids. The fishing industry is discussed in Chapter XV, where it is shown that in general the demand for fish is not supplied, and that it is doubtful whether modern trawlers and equipment can be introduced to increase the supply. The inhabitants of the Philippine coasts eat fresh fish, and sometimes surplus catch is dried. "Bagoong" is the form of preserved fish most consumed along the seashore and especially in inland towns. It is essentially raw fish mixed with salt and allowed to ferment for days, months, or even years. Its nutritive portion is mostly proteid, but because of the manner of its preparation and the fact that it is essentially decayed animal matter it is not a good food. The quickest and most practical way of providing a sufficient amount of proteid for the diet of the Filipinos is to encourage the growing and eating of beans as has already been suggested in Chapter IV.

Pork is the principal meat consumed and is found in all Philippine markets. The amount available can be increased by the systematic raising of hogs for the market and by improving the breeds. Very little beef is now eaten by Filipinos, since few cattle are available. If rinderpest can be held in check, it is possible that the number of cattle in the Islands will increase sufficiently to furnish a supply of beef adequate to domestic demands. The present situation can be relieved to some extent by importing chilled or cold-storage beef from Asia and Australia (see Chapter XIV).

The alcoholic liquors consumed by Filipinos may be divided into two classes: distilled liquors and the fermented juices. In the fiscal year ending 1912 there were produced in the Philippines, according to the Collector of Internal Revenue, 10,700,000 proof-liters of spirits, distilled from the sap of the nipa and coconut palms and from sugar and grain. This is an average of 1⅓ liters per capita for the Islands. In addition great quantities of tubá, the fermented sap of the coconut palm, are consumed in the Visayan Islands, and a considerable amount of basi, a drink made from sugar cane, among the Ilocanos.[1]

Filipinos are much greater consumers of tobacco than of alcoholic beverages. In the fiscal year 1912 there were consumed in the Philippines 110,000,000 cigars (14 per capita) and 4,350,000,000 cigarettes (550 per capita). The chewing of buyo is also widespread, although it is much less prevalent among the rising generation. The smoking of opium, which threatened to become general, has been prohibited by law. Both coffee and chocolate are common drinks, particularly for the morning meal.

Filipinos do not have a sufficient variety of food. Too often the laborer is content with a pot of rice or corn and a little salted or dried fish, with now and then some greens. Some even eat plain corn or rice three times a day. Some eat but two meals a day. An instance is on record of a population of 88,000 persons among whom one beef and twenty hogs are killed weekly. This population is described as being generally very improvident, making little provision for the morrow or even the next meal. Under such conditions the laborer does not receive enough nourishment to sustain his body properly and permit him to labor efficiently. Such a description pertains to the lowest type of Philippine laborers and to the most backward communities. Against this type may be placed agricultural laborers who take pride in a full granary, who have considerable variety in their meals, and who in general are good livers

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Most imported spirits and wines and the domestic beer are consumed by the foreign population.

and workers. Place the ordinary Ilocano beside certain of the people to whom he emigrates, and the effect of his superior food will appear in his ability to "outwork" the man beside him.

Wherever Philippine constabulary or scouts are quartered among the poorly fed population, their superior endurance and strength is at once apparent. The Hawaiian Sugar Planters' Association report that the majority of the Filipinos who come to them have never been accustomed to work; that they come poorly clothed and ill fed, and that it requires considerable time to build them up properly for the work required.

With improvement in economic conditions in the Philippines, the amount and quality of food has increased to a less extent than other factors in the standard of living. However, there has been a tendency in the right direction. This has been particularly noticeable with respect to flour, in the importation of which there has been a steady increase. There are now few towns in the Philippines which do not possess at least one bakery, and bread with coffee or chocolate is the customary morning meal of a large portion of the inhabitants of the Philippines. On account of the ease with which it is packed, bread is also coming into favor as an article of food carried by travelers and for lunches in the field. The importation of potatoes is steadily increasing, and this vegetable is now found in the stores of most provincial towns. The same can be said of onions. The stores are offering an ever-increasing selection of canned goods, which are consumed daily and are always bought in quantities for fiestas. Recently the importance of vegetables has increased in the diet of Filipinos (see Chapter III).

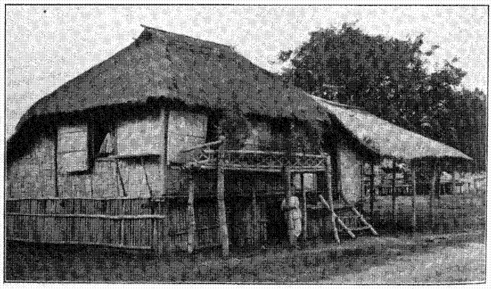
Housing

The houses in cities were formerly built of soft stone, and a few modern houses are now being constructed of stone, brick, or concrete with tile or galvanized iron roofs. The houses of the rich and well-to-do are often built of hard woods with galvanized iron roofs. Most dwellings, however, are made of bamboo with sides and roofs of nipa thatch or, in inland regions, of grass. The latter may be called the Filipino or nipa houses. The proportion of these dwellings differs in various agricultural communities. In Samar where much property was destroyed in war times, nearly all the houses are nipa. In modern rich towns, like Pagsanjan, Laguna Province, the number of wooden houses is quite large. Generally speaking, the town center has a few "hard construction" houses, while the barrios are built entirely with bamboo and nipa.

Nipa houses are often constructed with one room; many have three rooms, some five or six, and probably the majority have two. Considering tropical health requirements and the wealth of the people here, these are ideal houses for the Philippines. According to the Director of Health, if nipa houses are properly constructed with sanitary kitchen and drains, they are the most sanitary dwellings that can be built in the Philippines. The old houses of solid masonry retain dampness. The nipa house soon becomes dry. The well-ventilated nipa house is cool and less liable to harbor germs and disease, since it is exposed to the desiccating air currents and the germ-killing power of sunlight. The chief objection to the nipa house is its inflammability; where houses are grouped together whole blocks are soon burned. The fire is usually communicated from one burning house to another from the roof; hence the government is offering prizes for a substitute for nipa roofing which will be cheap, light in weight, and yet fireproof.

The problems connected with Philippine housing can be summarized in the one term *sanitation*. This is concerned with the ventilation of the rooms, the disposition of sewerage, the draining of lands about the house, the water supply, and the vending, preparing, and eating of foods. Lack of attention to these matters not only increases the death rate but also affects the physical condition of the people.

According to official statistics, out of 7788 deaths in Manila in the year 1911, 1052 were caused by tuberculosis of the lungs. This death rate from consumption is approached only by the city of Calcutta. Although tuberculosis is most prevalent in Manila, it is very widespread throughout the Philippines. It is even stated that there is scarcely a single family that has not one member a victim of the disease. Conditions for the spread of tuberculosis are perfect in those parts of the Islands in which overcrowding in unsanitary houses built close together in unsanitary places takes place. Moreover, the free access of air, which the construction of the nipa house so well permits, is usually shut off by the Filipino family, since windows and doors are tightly closed at night. Often as many as ten persons sleep in one room, with one or several individuals suffering from advanced pulmonary tuberculosis.[1]



ONE TYPE OF PHILIPPINE HOUSES

Organized efforts to combat consumption (antituberculosis work) have already been carried on in Manila for some time, and are now taking effect in the provinces through the schools and other agencies, chiefly the Antituberculosis Society.

The energy of the government has heretofore been chiefly spent in combating the dangerous communicable diseases —

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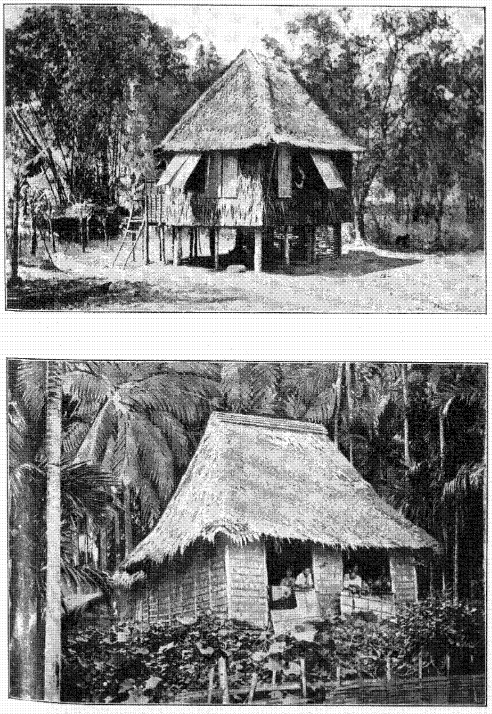
[1] From an article by Drs. W. E. Musgrove and A. G. Sison in *Philippine Journal of Science*, Vol. V, No. 3.



TYPES OF PHILIPPINE HOUSES

cholera, smallpox, dysentery, and leprosy. These are now held in check, and more attention can be given to the improvement of general sanitary conditions. According to the Director of Health, conditions on the Islands are better than they have been at any time in the last fifty years, and in comparison with other countries it may be said that the Philippines are healthy. By means of quarantine, infectious diseases have been kept out, while trained health service has been able to isolate and quarantine infected regions within the country. Towns and cities have been cleaned up. There are now nearly 1000 artesian wells in the Islands furnishing pure drinking water. Filipinos, too, have changed their attitude toward sanitary measures, for where formerly health officials were hindered, now they are assisted. Proper medical attendance, which has been lacking, is being provided through medical schools.

Clothing

In the temperate zones clothing is required to keep warmth in the body during a large part of the year and protect it from dirt. Clothing in the tropics has the latter function to an even greater extent, due to the presence of a greater number of bacteria; with respect to temperature its use is to protect the body against heat. The clothing of Filipino agricultural laborers is now well suited to their needs. It consists essentially of a broad-brimmed hat and of an upper and lower garment. Professor H. D. Gibbs from his investigations on sunlight in the Philippine Bureau of Science has reached the conclusion[1] that the ideal protection for the body in the tropics is doubtless an umbrella under which the subject is constantly in the shade and the radiation and evaporation of perspiration are unobstructed; and that it is remarkable how the broad hat and scanty, loose garments of the native in the tropics approach this form of protection. However, good clothing is often worn for the pleasure it gives the wearer, and living requirements of Filipinos have increased in greater proportion along this line than any other. Filipinos as a race desire to appear neat and well dressed. Hence much imported cloth, such as drills and calicoes, is worn; the use of shoes even among agricultural laborers is now quite widespread, and where a few years ago shoes were luxuries, they are now necessities.

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[1] From "Original Communications, Eighth International Congress of Applied Chemistry," XX, 176.

Amusements

Relative to his requirements for physical well-being, the Filipino has greater physical pleasures than the workers of America and Europe. He is materially better off than the laborer of Porto Rico or Java, for in the latter countries the pressure of population places before the poor man the unwelcome choice between constant labor and insufficient nourishment.[1] The amusements of the Filipinos may be enumerated as follows: gambling at cards and other games and at cockfights, fiestas, music, dancing, "sipa" (a game played with a rattan ball), new amusements such as phonographs and cinematographs and the like. The degree to which these amusements are enjoyed by the people is not the same throughout the Islands. Mr. Gil Raval, writing from Ilocos Norte, reports as follows:

> Their amusement is almost nothing. Drinking too much basi or wine at a wedding or christening party, and dancing and singing in the rice fields during rice harvest are regarded by them as their most enjoyable times outside of Christmas and the Fiesta of the Patron Saint of the town, when there are fireworks and "moro-moro." The farmer's wife has another kind of amusement. It is her great delight to go to church on holidays and to market on market days. She wears her Sunday dress, and on her head puts a finely woven basket full of vegetables and other things to be sold in the town. With the money she will surely buy several skeins of brightly colored cotton thread and one or two cocoanuts. Gambling with cards is unknown to these people. Cockpits in this section are not very well attended by farm laborers as

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[1] *Bulletin No. 58*, Bureau of Labor, Washington, D.C.

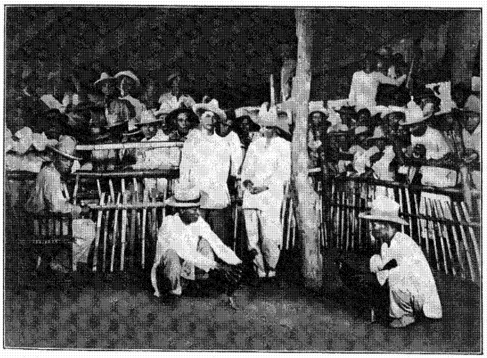
compared with those in the southern provinces. It is safe to say that about 98 per cent of the attendance in the pits here consists of those town people who follow gambling either for amusement or for their living.

The following, however, describes other conditions:

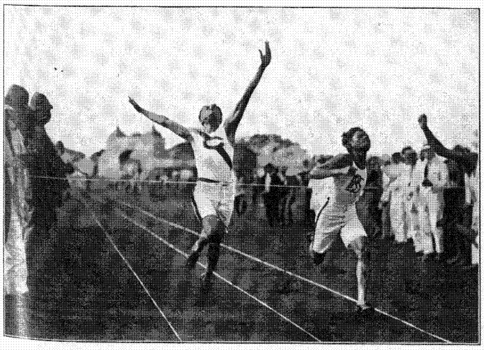
> The bulk of the money received goes for ceremonials, weddings, baptisms, and such "fiestas," at monte, the cockpit, and the like.

Cockfighting is not a sport for sport's sake nor even for the sake of seeing blood shed, but a game of chance. Cockfighting, cards, and lotteries were previously encouraged, and the Filipino's desire for games of chance is largely a question of custom and inheritance. It is widespread among all classes. According to the authorities of the Hawaiian Sugar Planters' Association the Filipinos are the foremost gamblers of the various people there; out of the 136 convictions of Filipinos in the district court of Honolulu, 82 were for "being present at gambling games." The ill effects of gambling on the mental and moral qualities of a people are always marked. The effects on economic conditions are quite as great. The desire of devotees of cockfighting and gambling at cards is not only for diversion but also for money easily gained. Their hope is to obtain in a day what would ordinarily take months or years of drudgery to earn; often to win freedom from a debt which holds them bound to the land. Yet on the other hand, gambling is often the cause of such a debt. A large population dependent on gambling for a living offers a very bad example of comfortable idleness to the productive agricultural laborers. In addition there is great economic waste connected with cockfighting in the time and energy spent on raising and training the cocks and on the food provided them. The immediate effect of this can be seen in the inferior condition of Philippine poultry (see Chapter XIV). As early as Pigafetta's time the following is noted concerning cockfighting:

> The sums that pass hands are large in proportion to the means of the gamesters. It is evident that this sort of diversion demoralizes more and more a people of itself given to idleness and vice and that is



A Cockfight



Athletic Games

OLD AND NEW AMUSEMENTS

> easily led by the impressions of the moment. The people cannot resist the temptation to get money without working for it. Many load themselves with debts on account of the losses which they suffer, and the bandits and pirates are in great part ruined gamblers.

Among the younger generation gambling is of much less importance than with the older people, and even among the latter it has decreased on account of the sentiment aroused through the schools and organizations, and because of laws prohibiting lotteries and games of chance and regulating cockfighting. However, people must have amusements, and if one is taken away from them, another must be substituted. Through the schools athletics are being given the people, and these will in time probably supersede cockfighting, while better homes, higher standard of living, and greater social life will lessen general gambling. Greater economic effort and interest in production will diminish the amount of idle time and the necessity of seeking amusement. It is noticeable that least gambling is reported among peasant proprietors. The adoption of baseball by the younger generation and the interest in it manifested by parents is a remarkable achievement, and throughout the Islands the effect of this and field sports in decreasing the attendance at cockpits is reported. Besides substituting a clean sport for cockfighting, athletics will better the physical condition of the Filipinos, and give both participants and spectators an idea of system and unity.

The feasts observed by the Filipinos are both public and private and occur on holidays and in observation of marriages, christenings, and the like. When carried to the extreme, the time lost in such ceremonials may be considerable, while the amount of food consumed could often feed a family for several months. A family sometimes spends its entire wealth on a fiesta, and even contracts a debt at heavy interest. Recently school functions and industrial exhibits and fairs have become popular as the industrial idea has been established.

Many modern means of amusement are finding a place in the Philippines. Among the most important are phonographs and cinematographs, both of which are now recognized the world over as excellent and instructive. There are few large Philippine towns in which cinematographs are not now located.

Summary

The standard of living has been raised much in the last ten years; this is perhaps manifest in greatest degree in the better quality and greater amount of clothing used and in the higher forms of amusements, but the careful observer also sees advances in housing and food. More strong-construction houses are being built, sheet iron is being substituted for nipa roofing, and cement houses are seen here and there. There is greater demand for tools, cutlery, and the like. More furniture is found in the houses. Kerosene has been substituted in almost every place for the dim, open coconut-oil lamps. Pianos, sewing machines, and clocks are common, where before they were rarities. Chart XXXII shows that in the ten years from 1900 to 1910 the imports of what must be considered luxuries for Filipinos increased almost sixfold.[1] Total imports only doubled during that period.

PHILIPPINE ISLANDS

INCREASE IN IMPORTS OF LUXURIES

IN MILLIONS OF PESOS

STATISTICS FROM REPORTS OF THE COLLECTOR OF CUSTOMS

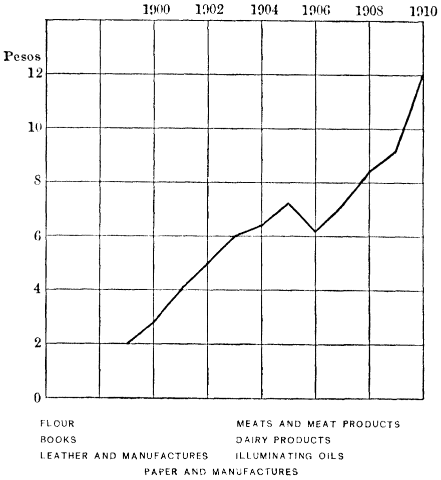


CHART XXXII

This increase in the standard of living has come about (1) through greater production and a larger portion thereof received by the laborer, (2) from general education, (3) as the result of travel, and (4) from the example of returned travelers and strangers. It is seen among all classes, but chiefly in the middle class now forming in the Philippines.

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[1] The dates and the articles selected preclude the possibility of the increase in these products being consumed by the foreign population.

EDUCATION AND TRAINING

Walker in his "Political Economy" states that the intelligent laborer is more useful than the unintelligent for the following reasons:

> (*a*) Because he requires a far shorter apprenticeship; he can learn his trade in a half, a third, or a quarter the time which the other requires; (*b*) because he can do his work with little or no superintendence; he is able to carry instructions in his mind, and to apply them with discretion to the varying conditions of his work; (*c*) because he is less wasteful of materials; (*d*) because he readily learns to use machinery, however delicate or intricate. Brains are not alone required for the invention of machines; they are required for their adjustment, their ordinary use, and their occasional repair.

The Filipino laborer is lacking in education and training. In Hawaii it is found that Filipinos are so unaccustomed to work, and are so ignorant of the customs and conditions found there, that it requires considerable time to train them for the work required on the plantations. In the Philippines it is now recognized that laborers accomplish a good day's work if intelligently supervised, but that they require foremen to keep them busy and show them what to do. In other words, they are lacking in system. The reason for this is that they have had few lines of activity other than agricultural open to them, and agriculture has been most primitive. Therefore, when required to do work which needs more intelligence and the use of modern implements, they are at first inaccurate. Their final success in competition with other nationalities in the Hawaiian Islands, the satisfaction they give on modern estates in the Philippines, and on public and private works, has demonstrated conclusively, however, that the Filipino can be trained to become an effective laborer.

DIGNITY OF LABOR

The ideas of a people as to dignity of labor in general and of certain forms of labor in particular are not the same, and are principally the result of local conditions. This is evident in the case of the Philippines. The older generation of Filipinos deemed any kind of physical labor a lowering of social position. This idea was undoubtedly obtained from medieval standards held during the colonization of the Philippines.[1] On this account, and from example, the Filipinos thought themselves raised socially when they were able either to direct manual labor without doing it themselves, or to do work which did not soil their clothing. Up to the last few years almost the only form of manual labor found in the Philippines was agriculture, and agriculturists were to a greater or less degree bound to the soil. For these reasons, therefore, the manual laborer was looked down upon, and he himself felt that he was inferior and thought that if he could acquire enough land to live without labor or could become a clerk, his position in life would be infinitely more agreeable and his class higher.[2] Soft hands and muscles, and a life of ease without responsibilities, was the end to be obtained. Education, policy, and example taught this. These marked the "illustrado," the man of dignity, education, and affluence. They set him apart from the producers of wealth as a person to be respected and perhaps feared, one to be envied and imitated.

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[1] In order to obtain an idea of the dignity in which manual labor was held in Spain during the time of its greatest influence on the Philippine character the book "Gil Blas de Santillan" should be read. While this book is a satire, it gives an idea of conditions existing at that time.

[2] In certain countries of Europe and in Japan, where the feudal system once existed, this feeling still persists. In new countries such as the United States and Australasia manual labor is not looked upon as degrading, nor does the farmer or mechanic feel himself inferior to the man who works in an office or who directs others. Greater wealth and the possibility of obtaining a living with less work are striven for, but the laborer is not considered inferior, nor does he feel inferiority. This condition, the willingness to submit to discipline, and an equal opportunity to advance, are the foundation of democracy.

Filipinos, therefore, have considered labor, and particularly manual labor, undignified. It is also interesting to note the relative dignity of different lines of effort open to them. The following lists are the result of observations made by different persons:

In general

1. Lawyer and doctor.
2. Government employee.
3. Merchant.
4. Big landowner.
5. Independent farmer.
6. Fisherman. (Ranks higher than 7 because independent.)
7. Tenant farmer.
8. Water carrier.
9. Road worker, laborer in general.
10. Street cleaner.
11. House servant, "muchacho."

In Sorsogon

1. Office worker.
2. Foreman.
3. Farm worker.
4. Road worker.
5. Pruning.
6. Abaca stripping (servant).

In Cebu

1. Official.
2. Teacher.
3. Clerk.
4. Farmer.
5. Fisherman.
6. Tubá gatherer.
7. Servant.
8. Wood vender.
9. Grain vender.

In Moro

1. Sailor.
2. Diver.
3. Boat builder.
4. Carpenter.
5. Agricultural laborer.

The fact that Filipinos were so long excluded from clerical positions has given to these an enhanced value in their eyes. Yet Filipinos really prefer agriculture to other kinds of manual labor, principally because they have always been used to it. There is necessarily little dignity of agricultural labor where the worst phases of the kasama system exist; but in many places agricultural labor is considered honorable when independent. Respectability usually rests more on the ownership of land than on anything else, and families try to belong to the landholding class even if the ownership embraces only a barren hillside. The Filipino prefers agricultural work, not only because he is used to it but also because it offers him greater freedom than the constant grind of routine work; it allows him to work in the early morning and late in the day and to rest during the heat of midday; his work is often nearer his home, and having no boss over him he can work according to his own inclinations. Filipino laborers will often refuse day labor on roads or other constructions to go to work in the fields at even half the wages. Some forms of agriculture, such as rice planting and harvesting, seem to be held almost in veneration, and in places it has been practically impossible to get men to do any other kind of work during the agricultural season.

The Filipino's ideas on manual labor have changed greatly in the last few years. There is a general concurrence in this opinion in every part of the Islands. This has undoubtedly been brought about by democratic examples, the teaching of democratic ideas, and the greater opportunity and measure of reward offered the laborer. In the more advanced agricultural regions the wealthier farmers and proprietors are not ashamed to be seen in working clothes superintending the farm or even actually doing work on it. In the schools and industrial exhibits the dignity and value of work have been emphasized. When the common schools were first established in the Philippines under the American régime, the family's servant, in many cases, carried the pupils' books to the school. Students, generally, expressed great distaste for industrial work of all kinds. This was a reflection of the ideas of their parents on the aims of education and dignity of labor. To-day, however, this opposition to, and dislike of, industrial instruction is not evident even with respect to such forms as gardening and corn growing, which necessitate work in the soil. The factors which are responsible for the almost revolutionary changes in the Filipino's attitude toward manual work in general, and agriculture in particular, may be enumerated as follows: (1) change from the medieval to the American point of view; (2) change in the aims of education; (3) industrial work; (4) inflow of capital, giving wider opportunity for employment in various lines of industrial effort; (5) greater protection of the laborer in the reward of his labor; (6) increase and diversification of wants.

Decrease in the drudgery of agriculture by the adoption of better methods and more machinery will even more greatly enhance its dignity.

REWARD FOR LABOR

BONDED DEBTORS[1]

There are two classes of individuals held by debt in the Philippines: the household servants and ordinary laborers. The first class is very common and usually comprises youths of both sexes from ten to twenty years of age. There are provinces and sections of provinces where most of the household servants are so held; in fact, it is a common way of holding servants. The second class includes laborers of various kinds, such as those who work on the farm, cattle herders, tuba gatherers, watchers of coconut groves, even sailors, and others who, although not properly household servants, may be called upon by their creditors for occasional personal service. Such laborers are usually mature men who become indebted.

Generally both classes of debtors are unable to read and write in their dialects and cannot perform simple arithmetical calculations. However, the laborers, being older, are able to do the simple calculations required in making money changes.

The debts are incurred either by the laborers themselves or by the parents. With the servants, the latter is almost always the case. There are various ways by which the parent pledges the service of his child for debt. The simplest one is where he borrows money from a rich man on the security of the labor of his child, who serves in the house of the creditor till the principal is paid. Another way is where a parent already in debt has some rich man assume it, and for security gives his child to be held until he is able to pay the new creditor in return. Sometimes the debt is inherited by the son at the death of his father. Sometimes a man, having taken on credit more goods than he can pay for, gives his child to pay his debt. It is a certain sense of honor and reverence to their parents that impels many to pay off such a debt.

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[1] For the relation between the share system and bonded debtors, see page 201.

The average amount of the debts incurred differs in the different provinces, and individual debts vary even more widely. Generally speaking, they range from ₱5 to ₱100, and the average amount in the Islands is probably from ₱20 to ₱30.

Naturally we should expect these debts to diminish with length of service, because the servant, as will be shown later, often receives a regular salary. But in many cases they increase in spite of the monthly deductions for salary, either because of new loans made or because the servants are charged for clothing given them, and usually also for articles lost or broken by them. From some of the accounts kept by the creditor it would seem well nigh impossible to pay off a debt with service, when the reward for such service is so small.[1]

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[1] Copy of original account of servant who began service on Feb. 1, 1911, at ₱3 per month.

Feb. 1.	Took cash	₱10.00
Feb. 20.	Took cash	2.00
March 15.	Took 1 hat	1.25
April 4.	Took cash	.50
April 20.	Took cash	.50
April 30.	Total	₱14.25
	Salary for 3 months	9.00
	Debt increase	5.25
June 3.	Took cash	₱5.50
June 22.	Took 1 pantalon drill	1.20
Aug. 27.	Took 1 patadion	2.50
Sept. 14.	Took 1 pieza sinemay	2.00
Sept. 30.	Total	₱16.45
	Salary for 5 months	15.00
	Debt increase	1.45
Oct. 8.	Took two cavans palay	5.00
	Took cash	3.00
	Took cash	.50
	Took cash	3.00

The household servants as a rule do not get a regular stipend. They are given their food and usually the cast-off clothing of the creditor's family. Occasionally they receive some spending money during a fiesta. Some creditors charge them for clothing, but others, especially the rich, do not. Those who get a regular salary are given very little, from ₱0.50 to ₱3 a month. This amount is generally less than that given to nonbonded servants, who get from ₱4 to ₱7 a month.

The treatment of household servants differs with different creditors. It cannot be doubted, however, that as a general rule they are treated as inferiors, but that their lot is not grievous. On the whole, they are better off with their masters than they would be by themselves, because their physical needs are thus securely satisfied, and they do not become public charges. It is the general observation of those who have reported on the subject that where conditions of living are hard, due to density of population, and a chronic condition of poverty exists, there indebted servants abound. Of course we must recognize that there are individual attitudes toward the servant class. There are some who chastise their servants regularly, and for slight mistakes; there are those who, by means of incorrect accounts, try to keep their servants in debt for longer periods of time than necessary. On the other hand, many treat their servants kindly, although as inferiors: some treat them as members of the household and give them a chance to better their conditions. It is even reported that an unusual number of masters help their servants in marriage by donating either a house or a piece of land to cultivate.

Several causes hold these servants to their lot. In the case of children pledged by their parents, the chief cause is, of course, parental authority. And probably this is the most potent force that keeps them in practical bondage. A second cause, especially in the case of those whose debts were self-incurred, arises from the difficulty of getting a living, already alluded to. Again, custom plays an important part in this connection and is reported to be one of the chief forces that hold bonded servants. Moreover, in many cases the servants believe themselves held by legal bond.[1] It is seldom that a written contract is made, and in many cases where there is no contract the servants are still made to believe that they are legally held. Other forces, such as shame and a certain sense of honor, have been reported, but probably *loyalty* would describe better the feeling which binds many servants to their masters. One looking only at the surface of conditions is shocked to find the existence of a servant class that is practically in bondage; however, this feeling is modified when one understands the close personal relationship which takes the form of protection on the part of the master, and loyalty on that of the servant.

Bonded debtors as described here are disappearing in a good many communities, and there are less of them to-day than during the Spanish administration.[2]

The following is a list of some Filipino names for bonded debtor and interest:

DIALECT	BONDED DEBTOR	INTEREST
Tagalog	alila, bataan, alipan, muchacho, propis	patubo, upa sa salapi, pakinsbang, tubo, baba, interes
Pampanga	magipus	tubu
Bicol	bataan, uripen, para utang, prenda, recibo	halaga, tubo, pagpagancia, interes, por ciento
Misamis	prenda, hipoteca	tubo, saca
Visaya	olipen, sologo-on, sulugo, utangan, binatonan	dihap, tubo, patubo, saca pasaca

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[1] Here is where more general education and better laws would be of great benefit. At present there is no law prohibiting a man from entering his child as servant and getting the child's salary in advance. Money borrowed by the man may be looked upon as the child's salary paid in advance, and not as debt.

[2] The data on bonded debtors were turned over to Conrado Benitez, Instructor in Economics, University of the Philippines, who, with the help of additional information collected by him, wrote the above discussion.

REWARD AND INCENTIVE TO LABOR

The Malayan idea of incentive to work has been debt and fear. The modern idea is greater dignity and reward. It is obvious that bonded debtors have no incentive to labor. Their position does not improve with greater effort on their part. Theoretically speaking, the various Philippine agricultural classes can be graded as follows with respect to their reward and its effect on incentive to labor: (1) bonded debtors; (2) wage workers; (3) share workers and share tenants; (4) peasant proprietors. However, other conditions must be taken into consideration, especially the education and character of the laborer and the attitude of the employer toward him. The share system offers no incentive where exorbitant interest rates hold the tillers of the soil practically indentured to it. The laborer for daily wage is not efficient if held in the same manner, or if not imbued with sufficient honor to give full labor value for his wage. Even the peasant proprietor may be a relatively inferior producer if false pride in his position as landholder and love of gambling draw him away from the land. In all these points Filipino agricultural laborers differ, not only individually but also by groups and according to custom and conditions in various regions.

In general, however, the Filipino has lacked incentive to labor because he has not received the rightful share of his production, nor has he been protected in his property. Small return, lack of security, and apathy of the government toward industry contributed not a little to foster indolence. Greater effort did not result in greater reward. The laborer could be deprived of his savings in many ways. The possession of much wealth carried certain dangers with it. Hence the Filipino lacked incentive to earn more than the absolute necessities, and came to feel that only by immediately consuming them could he enjoy the results of his labor.[1]

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[1] The writings of José Rizal may be consulted on this point, that the indolence of the Filipino results from lack of incentive to labor.

Unlike working classes in Europe and the United States, where harder conditions of living exist, Filipino workers cannot be driven by the scourge of necessity to sustained industrial activity; hence the relation between reward and efficiency is especially important here.

Numerous instances may be cited in which it has been proved that the greater the Filipino's incentive to work the better laborer he becomes. Small piece contractors on local railroads show double the efficiency of day laborers.[1] In the Hawaiian Islands, Filipino contract laborers in cane cutting, and contractors who cultivate a piece of ground and sell the product to plantations, earn more than the day laborers. Moreover, sugar planters there state that, though Filipinos do not work regularly in the beginning, yet, after the first money is spent for fancy clothes and ornaments instead of for the necessities of life, they usually settle down to regular work, earn more than enough to live comfortably, and increase in efficiency.

With better education, with the knowledge that he will be protected in the reward of his labor, with greater and higher wants, the law of increased efficiency with increased reward will apply to the Filipino even more than it now does.

Mobility of Labor

The demand for labor in agriculture varies with the season and is greatest at the planting and harvest seasons. The degree to which this demand is supplied depends upon the mobility of labor. In the United States, for instance, there is an exodus of workers from the city to the farm and orchard during the harvest seasons, and a movement of laborers from south to north as the crops mature. In Ceylon there is a seasonal movement to the tea plantations from India.

Such seasonal labor movements also occur in the Philippines. Within given regions they often take place from town to town; one town plants a variety of rice which matures early, another, one which is harvested late, and so the harvest occurs at intervals. In such regions many persons move from town to town to help in the harvest. When the crop is short in any one place an especially large number of persons participate in the exodus from it to the rice fields of more fortunate regions. While these people often belong to the small floating population which goes from barrio to barrio as work demands, yet most of the harvesters are permanent residents of some one locality. Hence the ill effects of this system can be seen (1) in the temporary abandonment of home and domestic animals (for whole barrios are often deserted), (2) in time lost in traveling, and (3) in loss in education of children taken from schools. Yet such an influx of laborers is often necessary for the harvesting of the rice crop, and in densely populated districts the added supply of rice so obtained is very important.

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[1] Report of the Philippine Commission, 1907, p. 1021.

There are also several large areas in which the labor supply for the harvest is deficient, and definite regions from which labor is commonly drawn to them. Such regions are shown on Chart XXXIII.

The character of the movement from Panay and Cebu to the sugar fields of Negros has already been discussed in the chapters on sugar and land tenure. It involves several thousand men, usually not accompanied by their families. Most of these are rice farmers who leave after the harvest and return for planting, a period from November to March. Many go back to their homes as poor as they left or with only better clothing. Some have saved money for the purchase of land or work animals. This differs from other movements chiefly in that the laborer is brought in under contract and works for a wage.

There is also a movement from parts of Batangas to San Pablo in Laguna Province and to Tayabas Province where the laborers work in the coconut groves.

The other great seasonal labor movements indicated on the map are in connection with rice harvests. The most important of these is that of Ilocanos to the Central Plain of Luzon

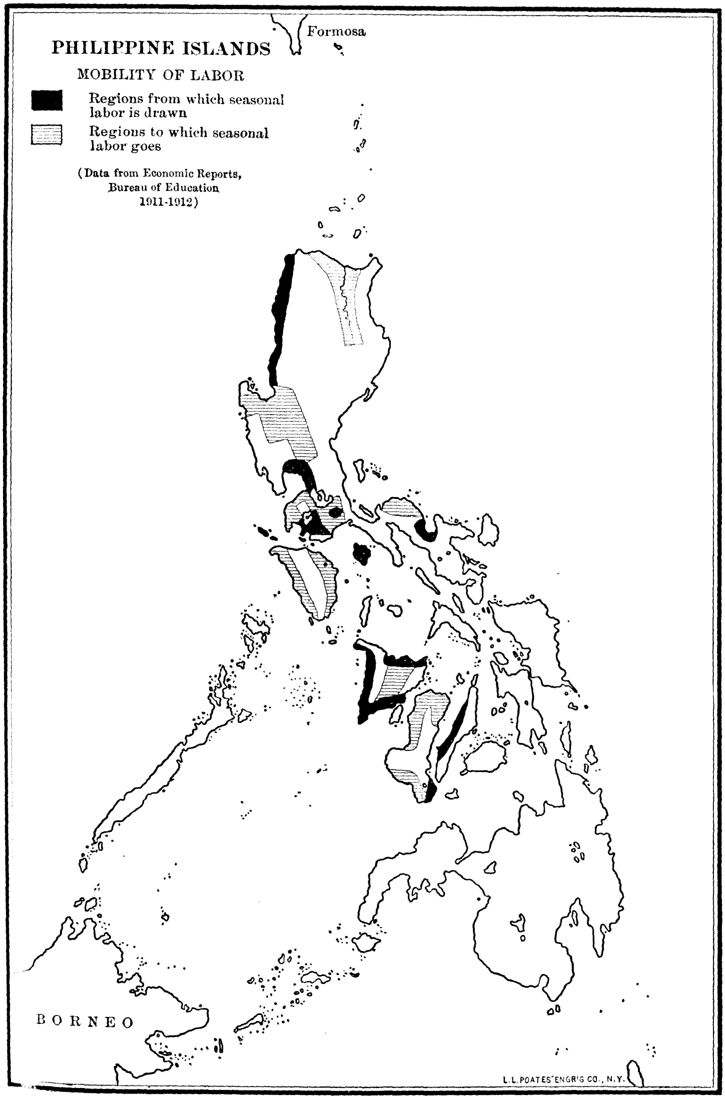
PHILIPPINE ISLANDS
MOBILITY OF LABOR
■ Regions from which seasonal labor is drawn
▤ Regions to which seasonal labor goes
(Data from Economic Reports, Bureau of Education 1911-1912)
Formosa
BORNEO
L. L. POATES ENGR'G CO., N.Y.

CHART XXXIII

(the provinces of Pangasinan, Tarlac, and Nueva Ecija). This movement occurs from December to April. Rice matures early in the Ilocano provinces, and after the harvest hundreds of families journey south in groups, some walking and camping, others going by sailboat. They harvest rice for one fifth of the crop. Some convert their share into money, but most of them return by boat with the rice. Many take cloths woven in their homes or in their locality and dispose of them to the people of the Plain. The Ilocanos are the most mobile of all Filipino peoples.

Harvest by outsiders is not always to the economic advantage of the owners of small rice fields, but custom permits any one to help in the harvest for a share of the crop. The ill effect of the large share given the harvesters has already been explained in Chapter II.

Lack of mobility of labor in certain sections of the Islands may be accounted for by the antipathy of the people and by the debt system which holds them to the locality.[1] The establishment of peace conditions, the construction of railroads, and in general the bettering of means of communication tend to increase the mobility of labor. This is noted in all parts of the Philippines.

PLANTATION LABOR

The discussion of agricultural labor as presented in Chapters XII and XIII is from the point of view of the country as a whole, and with respect to systems of agricultural organizations now extant. Investment of foreign capital in Philippine agricultural enterprises has usually taken the form of plantations on which a supply of efficient labor must be established and maintained. The increasing number of such plantations makes the question of an effective labor supply for them extremely important. Early in American occupation it was recognized that such a supply did not exist here, and the admittance of Chinese coolie labor was agitated. As a result such labor was definitely excluded by law from the Philippines and chiefly for the following reasons: (1) the natives object to Chinese; (2) Chinese seldom remain primary producers for any length of time; (3) Chinese become a commercial class, driving out of business native and white merchants; (4) they appear to be more oppressive exploiters of the natives than other employers. Since the passage of the exclusion law, the possibility of bringing in indentured coolie laborers under contract to leave the country at the end of their term of service has been brought up. In view of the fact that such systems have been recently repudiated in countries which have used them, such action would be a distinct step backward.[1]

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[1] This question is taken up at length under the heading Emigration in Chapter XVII.

Plantation labor here must therefore be Filipino. Much doubt was at first expressed as to whether Philippine agricultural laborers would ever be efficient enough for plantation purposes. In view of experience with them on various plantations now established here, and their success in competing with the laborers of other nationalities on the plantations of the Hawaiian Islands, it appears that Filipinos do make efficient resident plantation laborers if they are paid a just wage, are well housed in villages under attractive surroundings, are provided with amusements, are superintended by overseers who understand them, are assured of the receipt of the total wage earned, and in general are treated with justice. The use of a bonus, share, or piece system is also efficacious.[2]

The creation of a resident labor supply is, of course, imperative on a modern plantation. The measure of success which the Filipino laborer has attained in the Hawaiian Islands and the cause of it may be understood from the following extracts:[1]

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[1] For a discussion of this point see any United States text on colonial government. "The History of Colonization" (published by the Bureau of Education, Manila), Chapter XVI, may be reviewed.

[2] The question of the supply of such labor and the regions from which it can be drawn is taken up under the heading Mobility of Labor in this chapter, and under the heading Emigration in Chapter XVII.

> Filipino immigration to Hawaii was started in a small way in December, 1906, between which time and December, 1907, approximately 200 Filipinos were brought in. In May, 1909, recruiting operations were again commenced, and from July, 1909, to September 30, 1912, approximately 10,400 arrived. On October 31st, 1912, our plantation pay rolls showed that there were 6724 men, 50 women, and 29 minors regularly employed. Of these, 2 men were working as skilled men, 5130 working as day laborers, 1291 working as contractors and 301 working as profit-sharing planters.
>
> Day laborers receive wages at the rate of $20.00 per month of 26 days of 10 hours each, plus overtime, and extra compensation for Sunday work when required. They are also entitled to a bonus on their yearly earnings, if they have averaged 240 days labor for the year on the same plantation, at a rate based on the New York prices of sugar. During the last year this bonus amounted to 13 per cent, and partial returns from 35 plantations show that 841 Filipinos received $15,487.02, an average of $18.42 each.
>
> Contractors are gangs of men who undertake certain specific plantation operations, such as cultivating fields of cane, cutting, loading etc., and are paid so much per ton of cane. Contractors receive a considerably larger amount than ordinary field laborers, ordinarily earning from $26.00 to $35.00 or $40.00 per month.
>
> Profit-sharing planters are those who take over portions of land and raise cane for sale to the plantations. These men also receive considerably higher amounts than day laborers.
>
> In addition to wages all laborers are furnished free of cost with comfortable houses in which to live, firewood, water for domestic purposes, and medical and hospital attendance.
>
> Comparatively few of the Filipinos coming to Hawaii have previously been accustomed to continued or systematic work, and their development into satisfactory laborers involves time, patience and careful supervision. I think, however, that they compare favorably with initial immigrants of other nationalities.
>
> At first, many of them do not work regularly, and we have noticed a tendency after the first pay-day to lie off and spend the money earned.

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[1] These extracts were taken from a communication received from the Hawaiian Sugar Planters' Association, Bureau of Labor and Statistics in answer to a schedule of questions. It must be remembered that the report was made on Filipinos in competition with labor from practically all countries from which contract labor can be brought into the Philippines.

much of it going for fancy clothes and adornments, rather than the necessaries of life. After the first money earned is spent, they are more apt to settle down to regular work, and, after finding they can earn more than enough to live comfortably and that they can make some saving, the majority of them increase in efficiency. Recently a good many of them have been returning to the Philippines, paying their own passages and with considerable sums of money saved up.

At first the Filipino is not capable of doing the heavier work on the plantation, and so far few only have taken the heavy loading contracts; in all other parts of plantation work they are gradually taking their places, even in the mills, and those who are doing contract work are, of course, above the average in efficiency.

The motives causing Filipinos to come to Hawaii are difficult to designate, as they probably vary in different cases. My impression, however, is that a desire for a change and a prospect of bettering their positions are probably the chief motives. . . . This office has no accurate knowledge of the number engaged in other gainful occupations. Many of the Filipinos are working for the Federal Government in the dry dock construction, as stevedores, as yard and house boys and in the pineapple industry. . . .

While the beginning of any immigration naturally has its drawbacks and discouragements, and while there are always many exceptions to the general rule, on the whole, our Association has found it worth while to encourage the coming of Filipinos. The majority of them have never been accustomed to work, come poorly clothed, ill-fed and ignorant of our customs and conditions, and it requires considerable time for the proper building up of their bodies, and training them for the work required. When this is done, however, the majority prove fairly steady and efficient workers and appear willing to work. The average man is not unruly, and all comply with camp sanitary requirements.

PART III. INDUSTRIES OTHER THAN AGRICULTURAL

CHAPTER XIV

THE ANIMAL INDUSTRY

DOMESTIC ANIMALS

The Philippines are naturally an excellent grazing country. The grasslands of the Islands comprise approximately 40 per cent of the total area.[1] In many parts there are extensive ranges of good pasture grasses, as well as large areas of cogon grass, which afford good pasturage if kept closely cropped.[2] The carabao is indigenous to the Philippines. Cattle, horses, and goats were introduced by the Spaniards from Europe, Mexico, and China. These rapidly increased in number and by 1609[3] were raised on stock farms in different parts of the Islands.

Previous to 1888 the amount of live stock in the Philippines was greater than the needs of the people required. In all grazing regions there were persons possessed of many thousand head of carabao, cattle, and horses, and plenty of animals were available for agriculture. Since that date, however, rinderpest, surra, and the ravages of war have reduced the number to only a fraction of what previously existed.

In considering the various domestic animals[4] of the Philippines, the carabao must be placed first as the most important.

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[1] See Chart XXVIII.

[2] For a discussion of Philippine grazing area, see Miller's "Commercial Geography."

[3] Blair and Robertson's "The Philippine Islands," XI, 89.

[4] This discussion of Philippine domestic animals is taken largely from the *Agricultural Review*, Vol. IV, No. 9.

Probably 90 per cent of the agricultural and transportation work is done by carabaos. They are used in preparing the land for planting, in cultivating it, and in transporting the crop to market. Their milk is used exclusively by Filipinos. Whether carabaos are better work animals than oxen is a debatable question. There can be no doubt, however, that the Filipino farmer and laborer prefer carabaos, and they are therefore given better treatment and more attention than any other domestic animals in the Islands. The particular advantage which the carabao has over other draft animals is its ability to work easily in mud where oxen are of little value and the horse is useless. This consideration is a most important one in the Philippines on account of the semiliquid state to which lowland rice fields must be reduced before planting. For work in these fields the carabao is the only animal in existence that is at all satisfactory. Though carabaos can draw heavier loads than cattle, they are really inferior as draft animals, since they are unable to work so continuously and cannot perform labor in the sun so well. Moreover they do not increase as rapidly and are somewhat more susceptible to disease.

The cattle found in these Islands came originally from China and Spain. There were formerly large numbers of them, but diseases have now so reduced them that only a few small herds are left. The larger individuals of the native cattle make good work animals, and many of them are used for that purpose. Most domestic cattle, and particularly those of the larger herds, are small in stature and are killed for beef. Their small size results not from lack of feed but because no fresh blood has been introduced into the herds for a number of years, with the result that the type of animal has deteriorated. Besides these native cattle, several thousands have annually been imported into the Philippines from China, Indo-China, and certain other countries. Most of these were intended for meat, but a large number were sent into the provinces and used for agricultural or transportation purposes. In order to improve local stock the Bureau of Agriculture has from time to time imported various breeds, and some of the crosses produced have proved very satisfactory. Among these the Nellore cattle of India are worthy of special mention, since they are seldom attacked by the tick and resist rinderpest — the two chief cattle pests in the Philippines. Little fresh milk is used in the Philippines, and only recently have a few milch cows been imported from Australia.

The horse of the Philippines is a descendant of the Sulu horse and the horses brought by the Spaniards from Mexico and China. While it is a small animal, probably no breed of horses in the world has the combined qualities of style, action, vigor, and endurance in the same degree that the Philippine breed has. This has doubtless resulted from the fact that little attention has been given them, and thus, by a process of natural selection, those animals have survived which are best fitted to endure the conditions of Philippine life. The Philippine horse is used for riding and light hauling. No heavy work in the field or on the road is performed by it; cattle and carabao are used instead. In mountainous regions horses are often utilized as pack animals.

To a person familiar with the horses of Europe or America, the uniformity in the types of Philippine horse and its limitation to light draft work seem peculiar. The types of European and American horses are many and varied and have resulted from selection and breeding. Some are strong, massive draft animals, used to pull great loads through the streets. Others are bred for work on farms. Then there are horses for driving in carriages and others for riding. Within each of these types there are subtypes. The horses from certain localities in the Philippines such as Abra, Batangas, and Cebu have a reputation for strength and speed, but no breed of horse has been developed here other than the general type. During the last fifteen years the demand for horses in the larger towns has resulted in depleting the farms of their best animals. The poorer animals have been left to reproduce their kind, and, as a consequence, the Philippine horse has deteriorated.

Before surra became prevalent in the Islands the supply of horses in all districts was plentiful. This disease, however, left many towns with scarcely an animal, and in all sections the price given for a good horse has increased several fold. Chiefly for this reason a large number of horses have been imported from Australia.

It is important that the native horses be improved, and this can be accomplished through selection, better care, and crossing with high-grade animals imported from other countries. Horses, since they have greater speed than either carabaos or cattle, would be more suitable for transportation and, except in rice paddies, would be better for plowing and tilling the land. As a matter of fact, in Cuenca, Batangas, much of the plowing is done by horses, and in certain localities the small native horse is now used for both plowing and tilling. Wagons hauled by native horses are seen on the docks at Cebu. In the Islands as a whole, however, the horse will not supplant other work animals for heavy transportation and agricultural work until the breed has been improved so as to give larger and stronger animals.

Swine are a source of great wealth in the United States, where large and important industries in agriculture, commerce, and manufacture are based upon them. It is doubtful if these industries could have attained their present state of development if it had not been for the care taken in improving the breeds of swine with a view to producing the greatest amount of meat and fat for the feed given. Swine are bred commercially on the farms, and are fattened for market on feeds the value and economy of which have been determined by experience or by scientific experiment.

In comparison with the attention given to raising swine in the United States, the situation in the Philippines is peculiar. Here they are really scavengers, for they are seldom penned and are compelled to find most of their food. The number of swine raised in the Islands is not great, but most families have a breeding female, the young from which are raised and eaten.

Usually, however, they are confined to a pen a few weeks before they are to be killed and are fattened by special feeding.

Philippine swine are long-nosed, narrow-bodied, and flat-sided. Their shape is not conducive to a large yield of fat and flesh, even though they do respond fairly well to feeding. The greater part of the population of the Philippines is dependent upon swine for its meat supply. Pork is found in nearly all markets, while beef is often lacking. There is always a good local demand for pork in all parts of the Islands and a constant shipment to the larger towns. There is also a large importation of swine products. Hence the Philippines offer an exceptional opportunity for the raising of swine on a commercial basis.

Good feeds for fattening swine are produced in the Philippines. At the present time chopped banana stalks and "tiqui-tiqui" are the most-used feeds, but these are of low nutritive value. Corn, which is probably the best of all feeds for swine, is raised here. By changing corn into pork the farmers in the United States make millions of pesos annually. Other Philippine hog feeds are peanuts, sorghums, and the various kinds of beans. Rice bran is abundant and nutritious. The milk of the coconut contains considerable nutriment and, instead of being entirely wasted as it now is, might well be saved and fed to swine, just as in the United States skimmed milk, a by-product of the dairy industry, is fed to them. Coconut milk should be used in connection with other feeds, however. Copra cake from oil presses is also excellent feed.

However, in order that the Philippine swine may be profitable, it is necessary to improve the breed. Swine of good breed have been introduced into certain localities, as, for instance, in Lipa, Batangas, where to-day can be found specimens which compare favorably with the American hog.

A small flock of goats wander about nearly every barrio in the Philippines. No particular care is given them, and they are seldom used except to furnish flesh for feasts and, in a limited way, for transporting small loads. The goat could be made of considerable importance in the Philippines if the value of its milk were understood. Goats' milk is superior to that of the cow or the carabao and is produced much more economically. In many countries, both temperate and tropical, it is consumed in large quantities. Some of the best breeds of milch goats, such as the Maltese, have already been introduced into the Philippines, and the increase of these would probably go along way toward reducing the high rate of infant mortality in the Islands.

There are no chicken farms in the Philippines, but each family usually has a few chickens for its own use. Poultry, next to pork, is the chief meat eaten, but in the Islands as a whole there is an undersupply of poultry and eggs which is due not only to the small number of chickens and ducks raised but also to their poor laying qualities. This condition is largely the result of cockfighting. The high valuation placed on the game bird, rather than on either hens or eggs, has resulted in the production of a small type of food chicken, which lays only a few small eggs and has tough and poorly flavored meat. The eggs annually imported from China amount to over 4,000,000 dozen yearly and are valued at from ₱600,000 to ₱700,000, but do not entirely supply the demand of the larger cities. In many of the smaller communities eggs are seldom available. Increase in the amount of domestic poultry and eggs may be brought about either by increasing the number of food chickens to a household or by raising poultry on farms as is done in the United States and in European countries. In any case, however, good results will be secured only by improving the breed of poultry. At the present time farmers often add to their income by the manufacture and sale of articles made in their homes. The sale of chickens, ducks, and eggs can also be made to yield additional income.

Poultry raising as a business has received some attention in and about Manila, but as yet little has been accomplished. Cleanliness must be the great care of poultry raising here.

ANIMAL BREEDING

In most civilized countries of the world man's control over flora and fauna is such that he determines their types. Improvement in vegetable forms by selection has already been explained. The effects of selection are often better shown in animals. For instance, the horse may be bred either for massiveness and strength or for speed; some cattle are bred for meat, others for milk-giving qualities.[1] Some breeds of chickens are noted for their laying qualities, others for the quality of flesh, and still others for their fighting cocks. Improvement in animals by selection is little practiced by Filipinos, and for this reason all the animals that have been raised on the Islands for any great length of time have deteriorated. By careful selection and the introduction of new breeds from foreign countries, great improvement can be made in all domestic animals.

FORAGE

Another problem connected with Philippine animals is that of forage.[2] In the temperate zone, grass is killed by frost or snow, and it is therefore necessary to grow and preserve forage crops for use during the winter months. In the tropics the growth of wild grasses and other forage plants is continuous throughout the year, except in regions which are subject to a dry season, and in these some system of irrigation is usually found.

The chief forage crop now cultivated in the Philippines is "barit" (*Leersia hezandra*), which is fed green. A large amount of feed is also obtained from the by-products of the crops grown for human food, the most important of which are rice straw, corn leaves, sugar-cane leaves, and peanut vines. Cattle and carabaos thrive on the native pastures and the grasses grown for forage, but the Filipino horses are insufficiently fed on their ration of green grass with an occasional small portion of unhulled rice. At present a sufficient amount of home-grown foods cannot be obtained for the several thousand horses which have been imported from America and Australia. Since about ₱3,000,000 worth of feeds are annually imported, it is important to find forage crops that can be grown and cured locally which will be good substitutes for the imported feeds so far as food value and cheapness are concerned. Experiments on local and imported grasses have been made to determine (1) which will yield palatable hay; (2) what the possibilities are of curing hay so that it will keep in storage; and (3) the profitableness of the crop as compared with other field crops. None of the local grasses give promise as hay crops. On account of the humidity of the atmosphere even during the dry season, only the slender stemmed imported grasses can be easily and satisfactorily cured. The best of these have been found to be Rhodes grass (*Chloris gayana*) and Tunis and Sudan grasses (*Andropogon halepensis* vars.). The production of corn-blade fodder from the grain crop seems practicable. Curing hay from all these plants during the dry season presents no great difficulty. From the point of view of market facilities, the best localities for commercial hay growing at present are in Luzon.

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[1] Gregory, Keller, and Bishop's, "Physical and Commercial Geography."

[2] This discussion of forage is based upon data from the *Agricultural Review*, Vol. IV, No. 8.

RINDERPEST

The greatest problem connected with agriculture in the Philippines is that of overcoming rinderpest or of holding it in check.[1] The history of rinderpest extends over a long period of years. It has existed on the continent of Asia since the earliest authentic records, and was carried thence by great migrations and by war and commerce. There are definite

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[1] This discussion on rinderpest is largely based on an article in the *Agricultural Review*, July, 1911, written by Dr. A. R. Ward, Chief Veterinarian of the Philippine Bureau of Agriculture. It sets forth the present policy of that bureau with respect to rinderpest.

Photo by Bureau of Agriculture

Curing an Introduced Grass for Hay

Gathering Zacate, or Green Feed

FORAGE

accounts of its appearance in Europe from time to time during the past fourteen hundred years. In the eighteenth century 200,000,000 head of cattle were destroyed by it in Europe. In its last invasion of England, in 1865–1866, some 279,000 head of cattle were attacked in eighteen months.

Long experience has demonstrated that rinderpest can be exterminated by the slaughter of the diseased and suspected animals, together with thorough disinfection, or by preventing the intermingling of the infected animals with the well. By these methods the disease has been overcome in Europe. In the past sixteen years an earnest effort has been made to control the disease with antitoxic serum, but a critical study of the results of its use has led to the abandonment of this method.

In the discussion of the history of rice imports it was noted that rinderpest was introduced into the Philippines about the year 1888. It rapidly spread to many of the provinces, and thousands of cattle and carabaos died. On the ranges of the Cagayan Valley 95 per cent of the cattle perished, and everywhere in the Islands the losses were tremendous. In 1892 practically all the cattle on Masbate Island succumbed to the disease. By the year 1894 the disease had largely spent itself, but only a small percentage of the animals that had before existed in the Philippines was left. These were apparently sufficient for the needs of the Islands, however, for few cattle were imported. With war times came the destruction of live stock and a reoccurrence of rinderpest. This outbreak was probably due to infected cattle brought in some of the numerous shipments arriving from the China coast, where the pest existed. Again resulted large losses from which the Islands have never recovered. This attack spent itself, but there have been sporadic outbreaks almost every year. Many of these are undoubtedly caused by infection from imported animals, and others by local infection.

The effect of rinderpest on economic conditions in the Philippines has been great. In agriculture it has caused the abandonment, permanently or temporarily, of thousands of hectares of land, and a consequent increase in rice imports; with carabao selling at exorbitant prices hundreds of people in certain sections were driven from farming in the lowlands and resorted to the kaingin or some other means of earning a living. It has also encouraged the growing of export crops such as abaca and copra, which do not require much labor and cultivation. It has increased the difficulty of carrying agricultural products to market. The additional cost of logging operations has checked the building of good homes because of the lack of cheap lumber. Finally, it has so reduced the domestic supply of beef that the diet of Filipinos now contains little meat.

The problem of increasing the number of animals in the Philippines sufficiently to meet insular needs is a difficult one, and has given rise to disagreements on the part of experts and other interested parties. Obviously the quickest and easiest method would be to import animals from other countries such as China, Indo-China, India, and Australia — all of which have a surplus supply. However, from the standpoint of the agricultural and industrial welfare of the Philippines, it is necessary that the animals imported be free from disease. Cattle from the countries just mentioned are subject to attacks of either rinderpest or pleuro-pneumonia, and their admission, even after careful quarantine, has been found dangerous, several outbreaks of rinderpest having been directly traced to them. Outbreaks of rinderpest have at times resulted from the introduction of animals which were killed for meat almost immediately. Hence, there is now an embargo on all foreign meat cattle, and none are imported into the Philippines. This procedure has affected the meat supply, particularly in the cities. The foreign population has always preferred meat imported in cold storage from Australia. Filipinos formerly had consumed beef brought in on the hoof from China and Indo-China, and to a lesser extent domestic beef, but it is probable that if the embargo on imported beef is continued, cold-storage meats for the consumption of the Filipinos will also be imported in large quantities from Australia, and perhaps Asia.

The high price which they bring in the Philippines warrants the expense of immunizing work bullocks for export from Asia to the Philippines. It has now been fairly well proved that the bullocks of southwestern Asia can be successfully immunized against rinderpest. Immunized animals from that region may therefore be imported for agricultural and transportation purposes.

The embargo was placed on imported cattle in order to protect the animals now in the Philippines from introduced diseases. Coincident with it there is being carried on a campaign to rid the Islands of rinderpest. The methods employed by the Bureau of Agriculture consist of confining the sick and of keeping the susceptible animals isolated one from another. In other words, it is hoped to eradicate the disease by quarantine. Pursuant to this policy districts in which epidemics occur are specially quarantined, and from time to time certain regions are searched for latent cases. This would be a much easier task were the agricultural and grazing lands of the Islands divided into parcels by fences, as they are in most countries of Europe and America. In the Philippines the lands are unfenced, and consequently animals graze together. In many of the Islands, and especially in Luzon, there is also an extensive movement of cattle from province to province, which increases the liability of spreading the disease. However, by local quarantine it is hoped to hold outbreaks in check, and by systematic effort to bring about the utter extinction of the disease in the Philippines.

Under the most favorable conditions the extinction of rinderpest will involve years of work with occasional periods of apparent failure; it will also cause annoyance and loss to agriculturists, who during quarantine can use their animals not at all, or only to a limited extent. That a policy such as is now being followed by the Bureau of Agriculture can be successful is proved, however, by the experience of other countries, particularly of England, in which rinderpest was exterminated in eighteen months.

If, by keeping out foreign cattle not immunized, and by local quarantine to protect native carabaos and cattle, rinderpest is finally exterminated in the Philippines, and if a sufficient number of cattle for agriculture, transportation, and food are raised, one of the greatest economic problems of the Islands will have been solved. Stock raising may become a very important industry in numerous grazing regions. In the meantime it is not probable that much capital will be invested in large stock-raising enterprises. The breeding of domestic cattle will probably be limited for some time in the future to isolated regions and to small islands.

CHAPTER XV

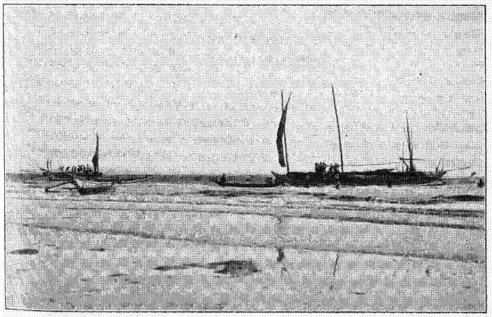
FISHING

INSHORE FISHERIES

The countless lights seen at night along the coasts of well-populated islands such as Cebu, and in fact of most islands of the Archipelago, are indicative of the extent of inshore fisheries in the Philippines. Most of the fish caught in the Philippines is obtained from these inshore fisheries, and while no large enterprises are involved, their aggregate magnitude is very great. Nearly all the Islands have shallow waters along the coasts, and the fishing banks are prolific and widely scattered. Those whose commercial value is best known are located at Sitanki, Masbate, Cebu, Corregidor Island, Cuyo Islands, Zamboanga, and San Miguel Bay.

Although other methods of fishing are employed, the use of the dragnet is distinctly the most efficient and popular. The boats ordinarily used for this kind of fishing are fairly large and carry from thirty to forty men. Work is usually done at night, when lights can be used to attract the fish. For catching small fish along the beaches and shallow waters purse nets and hand traps are used by men, women, and children. Shrimps, clams, oysters, crabs, and other shell fish are also gathered. Fish corrals, or traps, made of bamboo have been used in the Islands from historic times. The natives were using them when the Spaniards first came to these Islands, and now a large part of the fish consumed here is caught by this method. Commercially speaking, this is the most profitable of all methods employed, and owners of these traps usually make good profits.

As a rule Filipinos who live along the coast divide their time between the farm and the sea. Few of them make a business of fishing. Outside of large towns it is usual for each family to secure its own supply of fish food or to purchase it from those who have been more diligent or fortunate. On extremely successful days the catch may exceed local demands, and excess fish is carried to other towns. Near large towns, especially where prolific banks exist, there are barrios which live almost entirely by fishing. For instance, at least 80 per cent of the people in the Malabon district of Rizal Province derive their living directly or indirectly from the sea. Even around Manila Bay, and on the rivers and estuaries emptying into it, may be found towns largely dependent upon fishing. Their product is sold in Manila and other large places. In general, however, a fishing barrio is the poorest part of a town. The people barely make a living, and in many cases have to supplement their income by means of a few coconut trees or other small plantings of grain or tubers around their houses.



BOATS USED IN INSHORE FISHING

In certain localities in the Philippines, such as the mouths of the Cagayan River in northern Luzon, and the Agusan River in Mindanao, schools of fish appear at certain seasons of the year and the catch is often quite large. During these "runs" the inhabitants of surrounding provinces come in their boats. It is estimated that 2500 persons from Ilocos Norte alone come each year to the fishing grounds near Aparri. The fish are dried or made into bagoong for shipment inland.

The fishermen are not necessarily the owners of the boats, nets, and traps with which inshore fishing is carried on. The work is often done on the share system, the size of the share varying with the method of fishing. In Batangas from eight to twelve men operate a boat under the direction of a headman, who sells the fish and divides the money among those concerned. The owner of the boat and nets receives one half, and the other half is divided among the men, the headman receiving double the share of any other. When the boats and nets are owned by different persons, the owner of the nets receives one fourteenth, and the owner of the boats, six fourteenths, respectively. In some other places the workers are paid in fish at the rate of about ₱0.50 a day. In general, however, it may be stated that where boats and nets are used the catch is divided equally between the owner of the equipment and the fishermen. Under this arrangement the fishermen repair the nets or make new sections during the off season.

Five men are usually required to run a trap and keep it in repair, and it is not often that an owner personally takes care of it. The catch is divided into two parts, half for the owner and half for the laborers. A division more advantageous to the owner is that in which he receives all the fish until he is reimbursed for the expenses of making the trap, after which he takes one half the catch and divides the other half among his laborers. In a few instances the men are hired outright to tend the trap.

It is not often that fishermen themselves vend their catch. Usually fish merchants (men or women) purchase the fish and sell it again in the market or peddle it about the town.

FRESH-WATER FISHERIES

In several of the larger fresh-water lakes of the Philippines considerable fish is caught. For instance, it is estimated that the amount of fish taken during one year along the northeastern shores of Laguna de Bay is worth about ₱40,000. The methods by which these fish are caught and the division of the product are similar to those of inshore fishing.

The rivers contain several varieties of fish. The mud fish is found in abundance, the number caught in the rice fields sometimes being so large that the fishing privileges are sold at plowing time. Besides the mud fish, frogs are obtained as well as fresh-water clams and other shell fish. Much river fishing is done during the rainy season or when people are not engaged in planting rice. Boats, nets, and traps are used in the rivers, and in the shallow fields hand traps are much employed. Some fishing is also done with hook and line.

These fresh-water fish, together with fresh or preserved fish imported from the coast, constitute a large part of the proteid food consumed in inland sections of the Philippines.

FISH CULTURE

In the provinces surrounding Manila, and to a certain extent near Iloilo, milk fish are grown in ponds and form an important part of the commercial supply of fish for these two cities and the country surrounding them. The ponds are very valuable, as it requires considerable capital to build them and to carry on the industry.

PRESERVED FISH

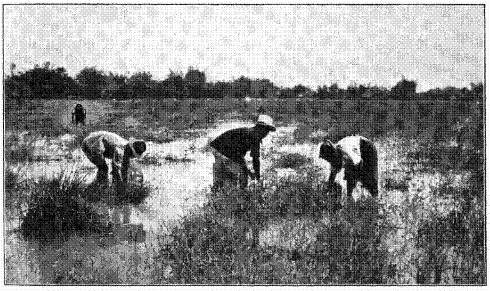
A large part of the fish eaten in the Philippines is consumed fresh, chiefly because the majority of people obtain their own fish supply. However, if there is a surplus it is often dried and thus preserved for a few days. Fish caught in commercial quantities is made into bagoong, or sometimes is smoked.

The food value of bagoong has already been discussed in its relation to the standard of living. Preserved fish is of course more generally consumed in the interior than along the coasts.

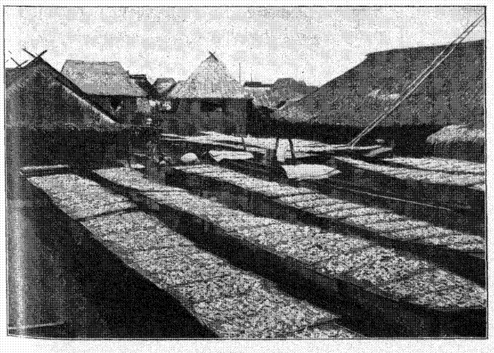
INCREASING THE SUPPLY. DEEP-SEA FISHING

The market for fish in the Philippines is greatly undersupplied. There are few towns in the Islands which at the present time could not consume more fish than is available. In many sections the poor buy canned salmon because it is cheaper than local fish. This condition is the result of the inadequate methods of catching fish and the fact that only inshore fishing is carried on, and hence the largest and most prolific banks are almost untouched. The imports of fish into the Philippines are valued at over ₱1,000,000 annually and consist, for the most part, of cheap canned salmon and sardines.

In other countries in which fishing is an important industry operations are often carried on a long distance from home. Large sailing or steam vessels are employed to carry the fishermen and their smaller boats to the banks, where they remain several days. Often small steamers or launches are used to manipulate the nets. By these methods great quantities of fish are caught in the deep-sea banks. The lack of fish in the Philippine market has led to interest in these larger fishing enterprises, and the government, as well as private companies, has investigated the matter with a view to improving existing conditions. The reports, however, are unfavorable to the use of extensive fishing methods. The capital which must be invested in such an enterprise and the expenses connected with it are very great. Consequently, in order to make it profitable the catches must be large; but fish in the Philippines do not seem to be abundant except in the vicinity of coral reefs, and operations over these result in the ruining of expensive apparatus. Efforts to use large apparatus in fishing had therefore been given up until recently, when the Japanese



INLAND FISHERIES—CATCHING MUDFISH WITH HAND TRAPS IN THE RICE FIELDS



DRYING FISH

became interested here. In Japan a large number of steam trawlers are used in the fisheries, and it may be that some such system can be adopted and made effective on the coral fishing banks of the Philippines.

MINOR SEA PRODUCTS

While food fish is the chief product of Philippine waters, certain minor fishing industries are of enough importance, either actual or potential, to be noted. Chief among these is the mother-of-pearl fishing carried on in the southern part of the Islands. This industry exports a product valued at from ₱250,000 to ₱300,000 annually. A small amount of tortoise shell is also exported from the Philippines. The export of prepared *bêche de mer* (trepang) also amounts to several thousand pesos. Among the most important fishing industries which will admit of commercial development in the Philippines is that of sponge fishing. Several excellent commercial varieties of sponges are found here.

CHAPTER XVI

FORESTRY[1]

Amount and Kind of Timber

As has already been stated in the discussion of the soil, it is probable that the entire land area of the Philippines was originally covered with unbroken forests. The second-growth forest, the grass, and the cultivated lands have resulted from the clearing away of trees. The present forest area is approximately 150,000 square kilometers, or about half the total area of the Islands. Of these 100,000 square kilometers, or about one third of the total land, consists of virgin forest. The second-growth forests may ultimately be developed into commercial stands, but at the present time they warrant small consideration.

In spite of the richness of the Philippines in fine furniture woods, the real wealth of the commercial forests consists in the dipterocarps — the construction timbers, such as the lauan, apitong, and yacals. There are two reasons for this: (1) much of the 2,000,000,000 board feet of standing timber in the Philippines is made up of the dipterocarp family; (2) these trees occur in stands sufficiently heavy to be exploited by the use of machinery, while the trees yielding fine furniture woods — such as narra, acle, tindalo, and the like — are scattered here and there throughout the forest, among trees of much less or no utility. The lumber output of the Philippines therefore consists principally of lauan and such construction material rather than of the finer furniture woods.

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[1] Unless otherwise noted most of the data for this chapter is taken from "The Forests of the Philippines," *Bulletin No. 10*, Bureau of Forestry, Manila.

GOVERNMENT REGULATION

In all civilized countries of the world the governments now regulate the utilization of the forests and protect them from fire and other destructive forces. The necessity for this regulation and care arises from several causes:

1. Lumbermen, if left to themselves, will give little consideration to the reforestation of the land on which they work. They annihilate whole forest areas, instead of cutting and utilizing only the mature trees and planting new trees to take the place of those removed. If unregulated cutting is allowed, deforestation of the country rapidly takes place and future generations are left without a lumber supply. Government regulation prevents deforestation in this manner.

2. Deforestation also causes floods and the destruction of waterways and fertile land. The dense growth of trees on mountain slopes tends to regulate the speed with which water reaches the ground and flows into rivers. In forested areas running water seeps gradually to the drainage streams and finds its way in even flow to the sea. As a result, destructive rushes of water do not occur in the lowlands, and the rivers are deep enough throughout the year to afford navigation facilities. Where the hills and mountains are denuded of their forest, the rain is not regulated in its fall by the leaves nor in its flow by the cover of leaves, twigs, and other forest litter: it rushes over the surface of the ground into the streams. During a storm the rivers flow in destructive floods, but when the rain is over they fall rapidly and become too shallow for navigation. Forests hasten the making of soil and help to preserve it; floods from bare hills cover the valleys with gravel and sand.

Deforestation in the Philippines may result from either the kaingin system or unregulated lumbering.

The kaingin system of agriculture has been considered under the discussions of the Subanuns and the soil. It has already caused a loss of millions of pesos to Philippine timber.

The making of kaingin is permitted under certain conditions and on such parts of the public land as are more valuable for agriculture than for forestry. The enforcement of the law concerning the making of kaingin is very difficult, however, and millions of pesos' worth of timber is still annually destroyed in the Philippines in this way.

In the theory of government regulation the government is considered the owner of all forests and forest products. It disposes of these in several ways, which may be summarized as (1) by giving them away, or (2) by selling them.

For domestic purposes all second-growth and lower-group timbers and all minor forest products can be obtained free of charge and without license. If a section of the public forests, known as a communal forest, is set aside, the inhabitants of a town are permitted to obtain the free-use products only therein. Under all other circumstances licenses must be obtained. In certain cases these are issued free of charge: (1) to inhabitants of the Philippines for first-group timbers to be used for the construction of homes of strong material; (2) to miners for all forest products growing on their claims and used in the development of their mines; and (3) for minor products, and second group and other lower-group timbers to be used in the construction of public works.

Licenses which must be paid for are four in number.

1. Miners must pay for timber and other forest products gathered outside of their claims and used in the development of their mines, but the amount which must be paid is only one half the regular rate.

2. Ordinary licenses provide for the collecting of products from certain definite areas and are granted for terms of one year, two years, or three years, renewable at their expiration. Full charges are made for these licenses, and more than one license may be given to exploit the same area.

3. Exclusive licenses grant to a single individual, firm, or corporation the exclusive right to gather forest products from a particular area.

4. Exclusive license agreements are granted for periods of not more than twenty years for large areas which can be extensively lumbered without permanent injury to the forests. When such an agreement includes more than 1000 hectares, the concession is put up for bid. The granting of such a license is contingent upon a guarantee from the company or individual which desires to obtain the area that an efficient plant will be installed and that a certain amount of development work will be done yearly. In this way it is impossible for companies or individuals to obtain forest areas for the purpose of holding them as investments instead of exploiting them.

The forest operations carried on under license are regulated by the Bureau of Forestry. On land which is more valuable for agriculture than for forest growth clear cutting is allowed. Where the land is more valuable for forest than for other purposes, the smaller trees and a sufficient number of seed trees must be left, and in certain cases it is not permitted to cut definite species of trees. The forestry employees also see that all the merchantable timber is utilized, that the stumps are not unnecessarily high, and that timber is not abandoned in the forest.

For the purpose of establishing a system of forest charges, the timbers of the Philippines are divided into four groups, and a decreasing rate per cubic meter is charged according to the value of the timber. The government also regulates the gathering of minor forest products and charges 10 per cent of the assessed market value of each product.

Logging Operations

In general the logging operations carried on in the Philippines are of two kinds — steam logging and logging on a small scale. Taking the fiscal year 1909–1910 as a typical one, we find that there were granted 775 licenses, both ordinary and exclusive, and that 44,000,000 board feet of timber were extracted, or an average of 57,000 board feet for each licensee.

Thus it is seen that the majority of the licensees are small operators, who use animal or human power to get the timber to tide water.

The method of extracting timber by carabao is crude and wasteful and, in connection with the methods of obtaining labor and of financing the enterprise, is the main cause of the high price of lumber in the Philippine market. As a rule the licensee is not the actual workman. He seldom if ever visits the forest, but furnishes a follower or friend with carabaos and other equipment, and receives a certain percentage of the value of the logs hauled to the beach. This follower or friend in turn selects the woodmen from his following, and pays a stipulated amount for the timber delivered on the beach.

The pernicious system of advancing money and provisions which applies to all Philippine industries is also found in logging operations, and the actual laborers are usually kept in debt to the men for whom they work. With the growth of the lumber industry such methods are fortunately going out of use. In many instances the licensee is the lumberman, who pays his workmen a direct wage and treats them fairly. As long as the former system exists, however, and the actual cutting of timber in the woods is left to ignorant workmen without supervision, the cost of construction timber will be abnormally high. What is needed more than anything else in small forestry operations in the Philippines is competent supervision of logging. With such supervision the cost of cutting timber and removing it to tide water could be reduced at least one half.

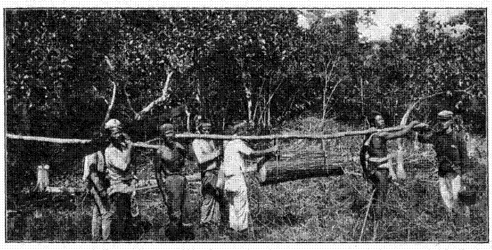
Certain portions of Philippine forests are adapted to small logging operations by animal power rather than to extensive modern operations by steam power. The former will persist and will be found profitable in isolated patches of the dipterocarp types and in patches of the molave type where valuable trees are too far apart to warrant the establishment of extensive logging machinery.

Several exclusive license agreements have been given to large companies, which use steam-logging methods and railroads to transport the logs from the forest to the mills at tide water. These companies exploit large areas containing close stands of merchantable timber, composed principally of lauan and other trees of the dipterocarp family. There are numerous forests in the Philippines in which such large operations can be carried on, and in the near future it is probable that many more companies will invest in this industry. Such logging and milling operations require a large amount of capital, of course, and are therefore carried on by corporations. The larger of these companies employ as many as 1200 laborers, most of whom must be brought in from outside. It is therefore necessary for a company of this kind to build a barrio capable of holding as many as 10,000 persons. The labor problem in forest operations does not seem to be a difficult one, for the supply is always equal to the demand.

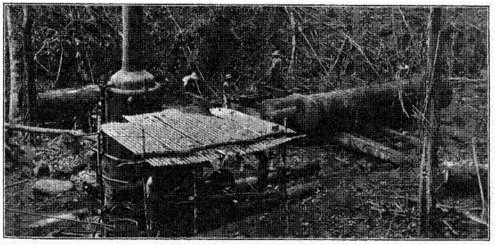
These large lumber companies are of great economic value to the Philippines, since they supply the home market with lumber which would otherwise be imported from America. Without the exploitation of the large forest tracts the mature timber goes to waste because the small licensees are unable to get it out. By close government supervision the mature trees are utilized and the stand is improved so that it becomes a constant supply of commercial timber.

MILLING OPERATIONS

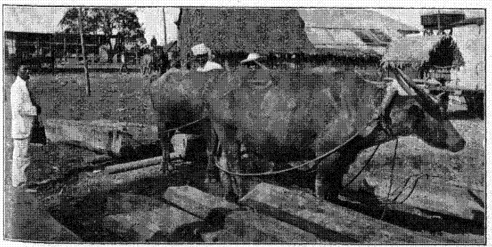
In milling operations two methods are to be noted — hand sawing and steam milling. At the present time hand-sawed lumber can successfully compete with the product of steam mills. The hand sawer is often able to manufacture 9 or 10 board feet from each cubic foot of lumber, while the steam mills cut 5, 6, or 7 board feet from the same amount of raw product. Moreover, all the waste from hand sawing is carefully utilized either for firewood for or other purposes. The



Human Power



Steam Power



Animal Power

LOGGING OPERATIONS

steam-sawed material, on the other hand, is all of standard size, and large contractors prefer to use it rather than the irregular-sized lumber from whipsawing. If it were not for this irregularity in size and the scarcity of whipsawers, the hand-sawed material would become a more formidable competitor of the lumber from the steam sawmill than it now is.

Problems of the Lumber Industry

The problems connected with lumber production in the Philippines are as follows:

1. To overcome the high cost of logging in operations carried on by small licensees. The high cost can be reduced by paid laborers, better supervision, and reform in the present crude methods and equipment employed.
2. To reduce the high cost of milling by better equipment and arrangement of the mills now used, by bringing in or training competent men to manage the operations, and by reducing the excessive waste now occurring in steam mills.
3. To lower the high cost of transportation, which is the result of exorbitant charges now made by shipping firms, by increasing the number of boats in the Philippines and consequently increasing competition for the carrying trade.

These problems are distinctively of a pioneer nature and will be overcome in time.

Markets for Philippine Lumber

There are two markets for Philippine lumber. During the fiscal year 1909–1910 the commercial timber produced in the Philippines amounted to approximately 44,000,000 board feet; at the same time the quantity obtained without charge was about 25,000,000 board feet. This was not enough to provide for the needs of the Islands, and 20,000,000 board feet had to be imported. Thus it will be seen that the local market in the Philippines is not wholly supplied from domestic timber, and that increased supplies of domestic lumber will for many years find a market here. The domestic demand for lumber is not fully shown by the figures quoted above. With lower prices the amount of lumber used in the Islands will greatly increase, for "hard construction" will take the place of bamboo and nipa. Nevertheless the question of foreign market is one which may at some time become of considerable importance. Should the local demand for lumber become satisfied, Philippine timbers will find an excellent market in China, where their reputation is good, and where the demand for lumber is enormous. At the present time there is a small export of lumber, principally to China and the United States, but this is incidental.

The increasing demand for lumber in the Philippines results in a large part of it reaching the markets in a green state, and in its being used before it is well seasoned.

The total lumber consumption of the Philippines (89,000,000 board feet annually) as compared with that of other countries is small. The possibilities of the lumber industry here are great, however, for large tracts of virgin forest are available. The thing most needed is capital. It is estimated that, without injury to them, the forests of the Philippines would yield 2,000,000,000 board feet of lumber annually, or about thirty times as much as is now obtained. While there is no prospect of the full utilization of forest wealth in the immediate future, it is nevertheless probable that if present investments continue, the next fifteen years will witness an output of 500,000,000 board feet yearly.

MINOR FOREST PRODUCTS

Minor forest products are also of considerable importance. The fuel used in Philippine households, and to some extent in commercial enterprises, is wood. Most of it is obtained from the mangrove forests and makes excellent firewood. Charcoal is another important product. Considerable tan and dye bark is now gathered from Philippine mangrove forests, and the possibility of extracting cutch from mangrove bark is worthy of careful consideration. The importance of rattan and bamboo in house construction, and for numerous minor purposes for which they are utilized by Filipinos, places these two forest products among the most important for domestic use. The amount of rattan produced in the Philippines is not enough to supply local demand, and a considerable amount is annually imported. At the present time rattan is chiefly gathered by the wild tribes and hill folk and is obtained from them in trade with the lowlanders. The amount and quality of rattan existing in the Islands warrant gathering it for export to Europe and America. The demand for bamboo is supplied almost entirely from uncultivated clumps of trees, although it is often planted. The planting of bamboo for commercial purposes is warranted by its present high price.

The principal minor forest products gathered for export are gutta-percha, resins (particularly almaciga), beeswax, candlenuts and dyewoods (particularly sappan). Nearly all of these are obtained in trade from the wild tribes and hill folk.

CHAPTER XVII

MANUFACTURING

Density of Population and Commerce and Industry[1]

The density of population of a country is reckoned in terms of population divided by total area. The density of population of the Philippines and of various other agricultural countries can be seen from the following table:

Australia	1.5	per square mile
Brazil	6	per square mile
Mexico	20	per square mile
Siam	30	per square mile
Cuba	50	per square mile
Philippines	70	per square mile
India	200	per square mile
Straits Settlements	350	per square mile
China proper	500	per square mile
Java	600	per square mile

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[1] The question of density of population is important with respect to food supply and the character of production. Given five men, each with two hectares of land, which lie in juxtaposition and are of equal fertility. Suppose that these five pieces of land are joined so as to make one farm which is worked by the five men. Because of the division of labor thus made possible, the crop from the ten hectares will be greater than if each man had worked by himself, and therefore the share of each man will be greater. Suppose that two more men are added, making seven laborers. Since greater division of labor can be carried out, the total amount of produce will be greater, and the share of each laborer will be larger. Suppose that two more men are added, bringing the total number up to nine. Then, on account of the increase of labor upon the land and the greater subdivision of labor, the gross production will be again increased ; but since the limit of the chemical and physical capabilities of the soil has been passed, the share of each laborer will be less. In the same way, for each laborer added the gross production will be greater, and the proportional production will be less. The more labor put on a given piece of land the greater will be the gross

In comparison with many countries, especially agricultural countries like China and Java, the Philippines are sparsely populated. In no districts are famine conditions of parts of India and China approached — when dense populations live on the verge of starvation, and a crop failure results in thousands of deaths from famine. The Philippines are still below the point of diminishing returns from land. As a whole, they need greater population. In 1800 Java had twice as many inhabitants as the Philippines, but in 1900 it had four times as many. This difference in the rates of increase has probably resulted from high infant mortality in the Philippines (as explained in Chapter XVI). It is probable, however, that the Philippine rate of increase is greater now than it has been in previous times.

The Philippines are not evenly populated (the different densities can be seen from Chart XXXIV). Several regions with rich soils are heavily populated, and some, such as the Ilocos provinces and Cebu, have a large population in proportion to the fertility of the soil and the amount of arable land. In 1903 Ilocos Sur Province had a density of 400 inhabitants per square mile, Cebu 340, and Pangasinan 335. On the other hand, vast amounts of fertile lands are not occupied, and many fertile regions are but sparsely settled.

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production from it and the greater the proportional return up to a certain point. After that point has been reached the more labor placed upon the given piece of land the greater will be the gross production, but the less will be the proportional return. This is known as the law of diminishing returns from land.

The same law which applies to a small piece of land holds good for a large section. Hence in any given agricultural community, after a certain population is reached the law of diminishing returns from land causes the food supply to increase more slowly than population increases. The law of Malthus is that population tends to increase faster than food. Any check on population or any increase in food supply diminishes the degree to which the law operates in a given region. The checks to population are (1) later marriage and fewer children to the family; (2) war, famine, and pestilence; and (3) emigration. Increase in food supply may result from (1) improved means of agriculture, which increases the production per hectare; (2) processes which make food products more nourishing; (3) manufacturing and commerce, the products of which are exchanged for food.

The three regions in which pressure of population is most greatly felt are (1) the Ilocano provinces, (2) Taal and Lemery in Batangas Province, and (3) Cebu, Bohol, Siquijor, and parts of Oriental Negros. These and the regions in which emigrants from them settle are indicated on Chart XXXV. Other emigrations are from the Batan Islands to Luzon; parts of Pangasinan to Tayabas; parts of Bulacan to Tarlac and Nueva Ecija; central Camarines and central Albay to northern Camarines, Catanduanes, Sorsogon, and Masbate; Ilongos from Panay to Negros; and Cuyo to Palawan. In addition, government labor agencies have obtained laborers from Manila, Cebu, Iloilo, Bohol, and Antique for Tarlac, Bataan, Mindoro, Mindanao, and Negros. In the past there has been too little emigration from the more crowded districts. In some places this results from the antipathy of the people and a very low standard of living. Many laborers have not cared to leave their homes because of fear for their personal safety and the safety of property and relatives left behind, but this is being remedied by peace conditions and better means of communication. Fear of Moros and semicivilized tribes still deters some from going to Mindanao. The clan feeling keeps many people in the place of their birth even when realizing that a better living could be made elsewhere. Also there has been opposition "by many landowners doubtless guided, rather than by solicitude for the public welfare, by purely selfish motives, such as the desire to have a constant supply of cheap labor, available for their own private work; cheap labor, thanks to the abundance of laborers in their respective pueblos."[1]

Immigrants from the densely populated parts of the Islands are considered more industrious than the people among whom they settle. Many immigrants, particularly the Ilocanos, buy or homestead land or become squatters, others become tenants or laborers and often finally accumulate enough money to buy land and work animals. Many return to the place of their

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[1] Quotation is copied from report of the Director of Labor, 1911.

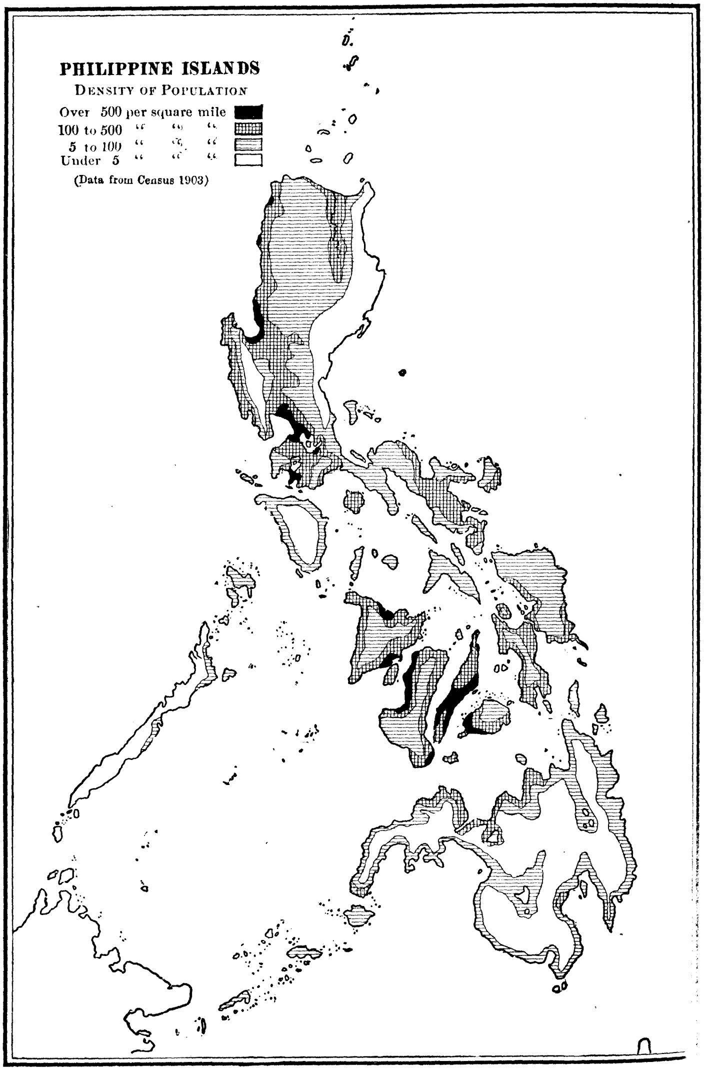
PHILIPPINE ISLANDS
DENSITY OF POPULATION
Over 500 per square mile ■
100 to 500 " " " ▦
5 to 100 " " " ▤
Under 5 " " " ☐
(Data from Census 1903)

CHART XXXIV

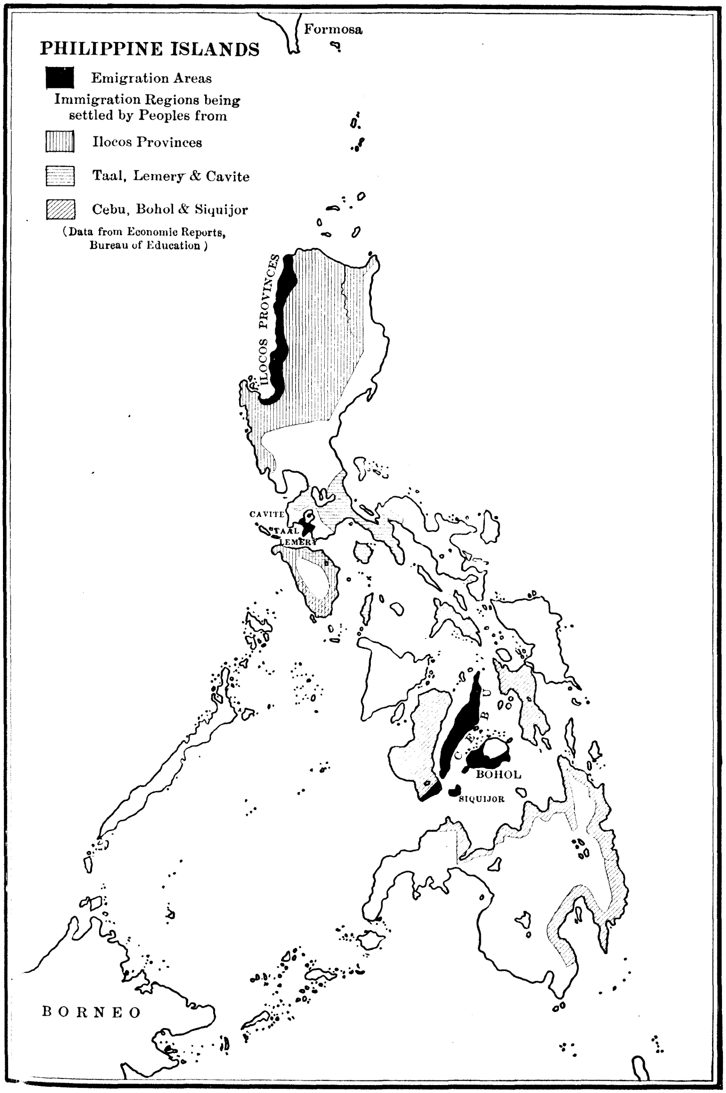
PHILIPPINE ISLANDS
Emigration Areas
Immigration Regions being settled by Peoples from
Ilocos Provinces
Taal, Lemery & Cavite
Cebu, Bohol & Siquijor
(Data from Economic Reports, Bureau of Education)
Formosa
ILOCOS PROVINCES
CAVITE
TAAL
LEMERY
CEBU
BOHOL
SIQUIJOR
BORNEO

CHART XXXV

birth after acquiring a little property. This is especially true of the Ilocanos and Taaleños.

In several densely populated regions the additional income obtained from commerce and manufacture supports a much larger population than could exist by agriculture alone. These regions are parts of the Ilocano provinces and Bulacan, the Taal-Lemery district of Batangas, Lucban in Tayabas Province, and parts of Cebu Province and Bohol. In all these regions there are people dependent wholly or in part upon manufacture for a living. There are other places not affected by pressure of population in which failure of crops resulted in manufacture. The weaving industry of Lipa, Batangas Province, dates from the failure of the coffee crop, and the extensive production of mats in Basey is the result of the typhoons which destroyed the rice and coconut crops. In general, manufacture is stimulated by a reduction of the harvest. Sometimes, as in the Romblon mat weaving, the output of manufactured articles decreases when returns from agriculture again become normal, but in many places the impetus of short crops has resulted in established industries. Where large holdings exist, the landless population sometimes becomes dependent on manufacture alone, as in the case of the chinela makers and shoemakers of Mariquina, Rizal.

In most cases the incentive which results in manufacture is the desire for a greater income than can be made from agriculture — money to be spent on amusements, better clothing, the education of children, and the purchase of land and work animals. The tenant or peasant proprietor obtains from his small plot enough produce to sustain him and his family. Returns from domestic manufactures often provide the only money income. Families which pursue household crafts usually have a higher standard of living than those depending entirely on agriculture. This peculiar relation of agriculture and industry results from the periods between agricultural activities (especially between harvest and planting, and planting and harvest) when the agriculturist is not busy in the fields.

It is chiefly the women and children who utilize these intervals in manufacturing, at the same time performing their regular duties of the household. The men are idle or engage in fishing, driving, or in daily labor for other persons. Sometimes they obtain and prepare the raw material for the women, as the bamboo splints for hats, the clay for pottery, and the like. The children perform the coarser work and learn their mother's trade by assisting her. The old and crippled often devote all their time to manufacture.

Household or Domestic Manufacture

1. The beginnings of manufacture are found in the attempt to provide the home with certain products made from raw materials. In the Philippines, *housework*, as it is called, takes the form of making the following articles: cotton, banana, and pineapple jusi, and abaca cloth; rice and winnowing baskets; fish baskets; fish nets; bamboo and rattan chairs; rope; mats; kitchen utensils; hats; pottery; hammocks; saddles; sieves; boats; harness; plows; harrows; wooden furniture; brooms; and rice mills and mortars.

2. The next stage in manufacture results from the different degrees of efficiency of the workers. Some become more expert than others, and their product is admired and desired. They begin to produce for exchange, especially when their landholdings become small. *Wagework*[1] is carried on when the consumer of the article furnishes the laborer with material and a wage. In the Philippines pottery, textiles, nets, bolos, steel articles, gold and silver jewelry, mats, embroidery, furniture, agricultural implements, and carving are the most important of the articles so made. The workers usually labor at home, but sometimes, as in the case of weavers, they work in the house of their employer. Some wageworkers become entirely dependent upon manufacturing.

3. In the *handicraft stage* the laborers produce articles from their own material in anticipation of a demand for them or on

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[1] The terminology used is Buecher's.

order. In either case the product is sold to the actual consumer. All articles previously enumerated are made by handicraft workmen in the Philippines. The producers dispose of their wares in various ways. Some sell them in their homes, some have small stores, others vend them in the local market. Some carry their product to neighboring towns on market days, or travel from house to house. Occasionally articles are gathered and kept for disposal at a fair, as the mats of Tanay, Rizal, which are sold at the Antipolo festival.

4. As soon as industry grows to national and international proportions, the middleman comes between the producer and consumer of manufactures. In household production this is known as the *commission system.* The producer no longer looks for the consumer. The merchant finds and organizes the market, determines its needs, and indicates the nature of the products desired. In the Philippines, hats, mats, sinamay, cotton cloths, baskets, pottery, sawali, buri sacks, bolos and other products of iron and steel, rope, embroidery, chinelas, shoes, and knotted abaca are the principal articles made and sold under the commission system. Most of the embroidery and knotted abaca and many of the hats are produced for export, and the other products are for the most part consumed in the domestic markets.

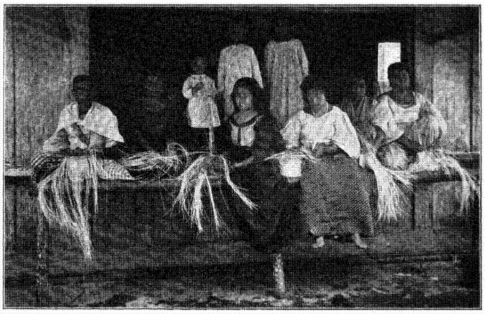
In a few instances these products are accumulated in the home and finally given to some one to sell on commission. Sometimes, as with Calasiao hats, a member of the family takes the wares to a retailer or exporter. Often the producers sell for cash to a regular merchant or agent. The advance and debt system is also found in commission household manufacture. Often the merchant advances the raw material, and sometimes money, food, and other things are given in anticipation of goods produced. Sometimes the merchant owns the implements (the looms, etc.) with which the work is done. The condition of the housework laborers under such an advance and debt system is often as bad as that of agricultural workers under the kasama system. They are subservient to the will of the merchant who controls their labor and output. In most towns there are local brokers or agents who gather up the product of the place and dispose of it to general brokers, domestic dealers, or exporters. In some towns two or three of these persons control the industry. When not effected through export houses closely in touch with the trade, such control sometimes results in inertness, as is the case in the sabutan hat industry of certain towns in Laguna Province. For the export trade the form and quality of the output is very important and is subject to change of fashions in foreign countries. Export houses control these matters through the brokers and agents, and in certain new industries they place the monopoly of buying in the hands of a few persons so as to exercise better supervision over the workers. With independent peasant proprietors, and where wagework and handicrafts coexist with commission work, so that the producer can, if necessary, sell direct to the consumer, control by middlemen is at a minimum. This is also true of towns which produce and export articles for which there is keen competition. This is seen among the Ilocano peasant proprietors and in the buntal hat trade of Lucban, Tayabas, and the knotted abaca industry of Lipa, Batangas.

Export demand often results in an industry being carried on under the commission system only. Usually, however, the community of manufacture is built up on all the different systems. The needs of the consumer or the worker seem to determine which of the systems is used; and the same worker may be under each of the different systems at different times. For example, a mat maker may use the mat he makes (housework); he may make a mat to order for some other person from materials furnished by the latter (wagework); he may make a mat from his own materials and sell it to the consumer (handicraft); finally, he may make a mat and sell it to a merchant who again sells it locally or ships it away (commission system). All four systems usually exist together, and the one used at any particular time seems to depend upon the demand for the articles and the needs of the workers.

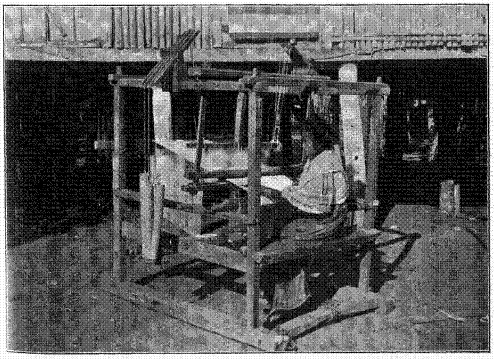
The wage received in commission work depends upon the demand for the article manufactured and the influence of brokers. In certain textile industries of Iloilo, where the weavers are largely controlled by brokers and the product competes with imported, machine-made cloths, the wage is estimated at ₱0.09 or ₱0.10. Here the worker, if dependent upon weaving alone, is apt to sink deeper and deeper in debt to the broker. Usually the wage is the same as that received in agriculture — from ₱0.30 to ₱0.60 per day. Wages are highest in the industries the product of which is in great foreign demand, and which are not easily controlled by brokers. The hat weavers of Lucban make from ₱0.50 to ₱1.20 per day, and the workers in knotted abaca often clear over ₱1 when prices are high.

The value of household products consumed in the Islands cannot be determined. Thousands of yards of cloth are woven and used each year. In several towns almost every house has a loom. Thousands of hats and mats are annually disposed of in the local market. Practically all the pottery used is of domestic manufacture. In 1912 there were exported over 1,600,000 hats valued at about ₱1,000,000, knotted abaca valued at over ₱1,200,000, and embroidery, textiles, baskets and the like in smaller amounts. In comparison with the millions of pesos' worth of household manufactures annually consumed in and exported from the countries of Europe, Japan, and China the output of Philippine households is small. When Europeans first came to the Islands the natives already practiced hand weaving, loom weaving, and other arts; the newcomers taught them crafts, such as embroidery, wood carving, and metal work. That these industries have not grown to greater proportions is due to (1) the lack of the industrial and commercial idea; (2) localization of industries in one barrio or town; (3) lack of improvement in methods; (4) lack of a market.

In the last few years the production of household industries has been increasing and can be measured in the foreign trade



Hat Weaving



Loom Weaving

TWO PHILIPPINE HOUSEHOLD INDUSTRIES

by the export of hats, which was less than 200,000 in 1907 and over 1,600,000 in 1912. Greater production of commercial goods in the home is coming about as the result of the industrial and commercial idea now felt in the Philippines. The established industries are spreading beyond the limits of the barrios and towns to which a certain immobility has heretofore confined them. New industries are also being founded through individual effort and from the result of industrial work in the schools; for example, the chinela and shoe industries of Gapan, Nueva Ecija, and Mariquina, Rizal, have grown from the success of one man or family. The Malalos balangot slipper, now sold all over the Islands, was first made in Malalos, Bulacan, in 1907 by a Japanese. The large basket industry of Bulacan town had its beginning in 1908 in the teaching of basketry in the schools. Industrial instruction in the schools has been general only during the past few years; yet the nucleus of several household industries, such as slipper making; basketry; textile, mat, and hat weaving; embroidery and lace making, has already been established in many towns. The aims of the Bureau of Education in promoting its industrial program have been very material in character. The attempt has been to turn the pupils directly and normally from the public schools into an industrial life which will enable them more adequately to meet their growing needs. Contrary to the prevailing theory and practice of certain other countries, industrial instruction in the Philippine schools is highly commercialized.

Commercial firms are beginning to invest money to finance household industries, the large hat production of Apalit, Pampanga, and neighboring towns being due to their backing. Moreover, free trade with the United States has opened up a large market. The entire basket production of the Philippines can be placed there for years to come. In 1911 the United States imported almost $80,000,000 worth of embroidery and laces, chiefly from Europe. Most of the hats exported from the Philippines now go to the United States.

There is an opportunity to establish large household industries in the Philippines, and their recent introduction and growth has been rapid. Care must be taken that the workers receive the greatest possible return and that they are not exploited by the middlemen. If household industries are carried on in connection with agriculture, either by the agriculturists themselves or by certain members of the family, industry is made secondary to agriculture and the workers are placed in an independent position. The greater the intelligence of the workers the less advantage can be taken of them, and therefore the schooling of the masses will make them as free agents in housework as in agriculture. Much division of labor, whereby the worker does only a small part of the work on a given article, places him at a disadvantage, for he then sells his labor only. If he makes a finished object, he can sell it to any one. The government may stand ready to purchase and dispose of articles from workers who are being exploited. Workers may coöperate to dispose of their goods.

It is always possible to produce an inferior article, and it is often possible to reduce the cost of production at the expense of the laborer. In the large cities of the United States and Europe both methods are employed in order to meet competition. The working of laborers in their homes and in shops (sweatshops) for the purpose of getting the greatest amount of labor from them at least cost is called "sweating." The lowering of quality and sweating are both ultimately disastrous. The reputation of the articles suffers, and efficiency of the laborers is reduced. Either laborer or merchant may ruin an industry by the shortsighted policy of immediate interest — exploitation.

The value of household industries in the Philippines rests on their correlation with agriculture — the utilization of spare time for production, the returns from which can be employed in increasing the standard of living, educating the children, and purchasing land, implements, and work animals.[1]

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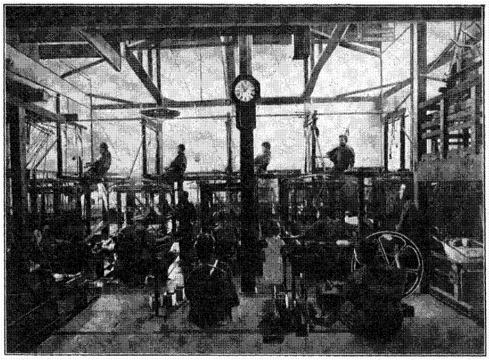
[1] In Batangas wages from the knotted abaca industry have enabled many tenants to purchase land. See pp. 186, 187, 206, 209, 212.

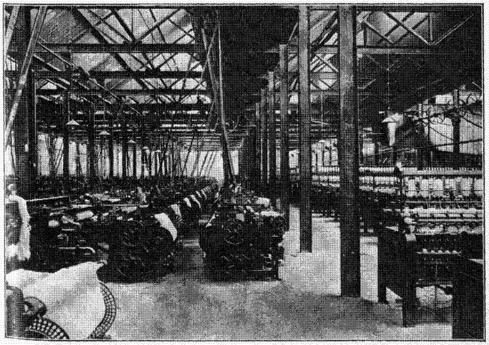
FACTORY MANUFACTURE

Under the commission system capital controls the marketing of the products of an unorganized army of laborers; the factory system divorces the workers from agriculture and organizes them into a compact and well-disciplined body. The embryo of the factory is occasionally encountered in the Philippines — in loom weaving, for instance, where original outlay for machinery is a factor which often cannot be afforded by the worker. Sometimes as many as ten looms are found in one house and are operated by laborers hired by the day. In such a case the owner is able to supervise all the processes of manufacture. Sometimes women are employed to knot abaca in the home. Chinelas are often made in small factories. Dyeing with indigo is sometimes done in factories. The factory system with hand labor is important in Europe, China, and Japan, but Filipinos prefer to work independently if they can, and the abundance of land in the Islands usually permits them to do so. Attempts to evolve factories from highly organized household industries, such as the hat industry of Lucban, Tayabas, have been failures. The only successful factories employing handwork are to be found in the tobacco industry; for instance, in the cigar factories of Manila, where hundreds of workmen are grouped in one establishment, little machinery is used. In general, therefore, it may be stated that manufacturing and agriculture are still closely connected in the Philippines.

Machinery is usually associated with factories for the reason that it must be placed at the source of power. The laborer must be brought to the machinery. He now works at regular hours and makes his home in the narrow confines of a city; thus his divorce from agriculture is complete. Machinery and the factory system have largely displaced household manufacture because (1) certain articles can be made by machinery and not by hand, (2) machinery produces in large quantities. (3) it is cheaper than hand labor, and (4) greater division



Japanese weaving by Hand



Power Looms

FACTORY WEAVING

of labor and utilization of by-products[1] are possible and result in a further decrease in cost of production.

There are few factories in the Philippines. Distilleries are about the only ones found in the provinces. Most factories

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[1] The members of a Philippine agricultural family are usually jacks-of-all-trades, — farmers, carpenters, fishermen, weavers, and the like. Yet division of labor among the sexes is carried out. The women plant the rice, carry on all household industries, and prepare and cook the rice. The planting and harrowing of fields, the construction of houses, and fishing are usually left to the men. In many places are found a few artisans, such as barbers, carpenters, blacksmiths, who devote themselves to their special work. The localization of industries is a form of division of labor and is largely the result of a local supply of raw materials. It is found among the Mountain Peoples (see Chapter I) and occurs to much greater extent among the Filipinos.

Division of labor may be summed up as that system of production in which one man or a set of men makes one part of an article or performs one step in the work. In some household manufactures in the Philippines it is not observed. In weaving mats and cloth, and in making clay jars, bamboo chairs, and bolos, the workers may do all the steps required to complete one article. In mat weaving, for instance, the weaver may cut pandan leaves and do all the stripping, bleaching, weaving, and selling. In bolo making, the blacksmith may buy materials from the Chinese store (no matter how many kilometers away the market is), go out to the forest to burn wood for charcoal, form and finish the blade, put on the handle, and on the market day sell his finished article in the town.

Usually, however, a certain division of labor occurs. In the making of copra different persons or sets of persons often do the picking, transporting to the kiln, husking, splitting, placing on the kiln, removing the meat, and sacking. In the production of abaca in quantity one man cuts down the stalks, another transports them to the stripping sheds, another separates the petioles, another strips the fiber, and still another puts it out to dry. The weaver of sinamay often buys the knotted abaca from another person. In the cleaning of rice division of labor takes place where one set of laborers pounds the paddy, another winnows it to remove the husk, another pounds the rice to polish it, and a fourth group winnows it to remove the bran.

Where division of labor can be carried on, the cost of producing an article is greatly lessened because time is saved and fewer tools are used. The laborers do not have to change from one part of the work to another and therefore become much more skillful and do the work not only better but also in less time. In the Philippines the women usually do the transplanting of rice because they are recognized as quicker and more skillful than men. Cigarette packers become so expert they do not have to count the number of cigarettes that they grasp ; their sense of touch enables them to determine the number in the hand. The joining of two bamboo hats to make a double hat is regarded as a separate part of hat weaving in Baliuag-Pulilan, Bulacan Province. The making of buntal hats in Lucban is divided into three are in Manila and a few in the other ports of entry. The most important are tobacco factories, rectifying plants, lumber mills, ice plants, ropewalks, cotton mills, shoe factories, and match factories.

steps: (1) the weaving of the crown and brim, (2) the weaving back of the fibers along the edge, and (3) washing and ironing the hat and curling the brim. Each group of workers is skilled in its particular part of the manufacture. In bolo making the assistants (apprentices) hammer out the rough bolo which the master workman finishes.

Tools are saved by division of labor, since they do not have to be duplicated. Instead of one man needing all the tools for the production of cleaned rice, for instance, each laborer needs only the one connected with his particular part of the work. Another advantage of the division of labor is that it provides light work for the young, the aged, and the weak, and common labor for the unskilled. For instance, among the Igorots the division of labor in agriculture is so arranged that the children and the aged do the light work, such as picking up the camotes which have been overlooked in previous harvests, and guarding the fields. In making single hats the skilled weavers begin the hats and weave the crown and the brim; the children and the unskilled workers finish the hats by weaving back the fibers along the edge. Children often knot the abaca used by their mothers in weaving. The modern centrals will allow the planter to devote his entire attention to raising sugar cane and leave to experts the manufacture of the sugar.

In factory work where machinery is employed, the tendency is to give each process to a different laborer. Hence, in the making, some articles, such as shoes, may pass through the hands of a score or more men.

In order to have division of labor extensive production is necessary. For instance, it would not pay to have a division of labor in the cleaning of one cavan of rice, or in the production of copra from a few scores of coconuts, or in the making of five shoes. It is necessary to have hundreds of cavans of palay and thousands of nuts or shoes.

A by-product is a secondary product obtained in the process of manufacture. Thus molasses, bagasse, and the leaves are by-products of sugar; husk, bran, binlid, and straw are by-products of cleaned rice. The principal product of the coconut is the oil obtained from the copra. The by-products are the oil cake, which is used for feeding animals; the husk, which is used for fuel; the useful coir fiber, which is obtained from the husk; the shell, which is made into household utensils for use in the Philippines and can be beautifully polished and carved; and the milk, which can be made into vinegar. A difference should be noted between a derived product and a by-product. Candles, for example, are not a by-product of the coconut, but a product derived from the main product — coconut oil. Sinamay and rope are not by-products of abaca fiber; they are articles made from it. The waste from the production of abaca fiber, useful in making paper, is a by-product since it is obtained as an additional product when abaca is stripped. In many manufacturing industries the profits are derived entirely from the by-products.

HOUSEHOLD *VERSUS* FACTORY PRODUCTION

The persistence of household industries in the face of competition with factory products may be thus accounted for:

1. Inertia often causes a household industry to persist even at prices which do not give a living wage. Many old cotton industries such as that of Taal, Batangas, in which cloths resembling machine-made textiles are woven, are in this condition. These are gradually growing less numerous however. Modern shoe factories recently established in Manila have somewhat injured the home shoe industry in Mariquina, Rizal. The fact that the leather employed in these factories is much superior to that used in Mariquina makes the product of the former preferable to that of the latter, even at a higher price. A large number of the skilled shoemakers of Mariquina are now working in these Manila factories and are making more money than they were formerly earning in their homes.

2. Where machine-made articles must yield a profit to several middlemen, they are often sold in a given region at higher prices than like articles produced there by hand.

3. Certain articles cannot be made by machinery, as straw braids for hats, knotted Manila hemp, plaited hats, and most varieties of baskets.

4. The demand for certain articles, such as the "gee" strings of the Mountain Peoples, is not great enough to warrant special machinery for their manufacture.

5. Household workmen can often understand and satisfy the demands of style better than the factory. This is seen in the Ilocano cloth industry.

6. A prejudice often exists in favor of handwork because such products are supposed to be better made. This is often mere sentiment, yet in certain articles finer and more perfect work can be done by hand than by machinery. This applies particularly to embroideries and laces.

7. In housework the workman labors for himself. Hence his interest in it causes his highest technical skill and his

whole artistic sense to be embodied in the finished article. This interest persists in wage, handicraft, and commission work; and for this reason handmade articles possess individuality and artistic qualities not obtainable in machine products.

Household manufacture the world over is not waning. On the contrary, it is being revived but is restricted to the spheres in which it has peculiar advantages. Its greatest importance is supplementary to agriculture.

LOCATION OF MANUFACTURE

1. *Raw material.* The supply of raw materials is an important factor in determining the location of manufacture. Thus rice mills are situated in rice-growing regions, sawmills in the forest, and factories near good harbors or railroad centers, where raw materials can be transported cheaply. The Philippine nipa shingle industry and the distillation of alcohol from nipa tubá, are centered in the river deltas on which large nipa swamps grow. The household manufacture of sinamay is largely confined to the abaca regions. The production of hats and mats from buri-palm straws (buntal, Calasiao, and buri) takes place near the large buri areas in Luzon. The chinela and leather industries of Gapan, Nueva Ecija, are dependent on each other.

2. *Cheap and efficient power.* Often raw materials are transported many miles to the supply of coal or to water power, as it has been found cheaper to take the raw materials to the power than to take the power to the raw materials. Thus iron ore is carried from Spain to England and from the mines around the Great Lakes to the coal of Pittsburg to be smelted. Raw cotton is sent from southern United States to the water power of New England and to the coal of Great Britain. Several factories are located in Manila in preference to other places because coal can be imported into Manila at a lower cost.

3. *Skilled and cheap labor.* The amount of skilled and cheap labor procurable in a given place largely determines the

extent of manufacturing there. In the Philippines raw materials are often sent from towns where labor is hard to get to towns where there is an adequate supply of labor. This is particularly true of such household industries as hat weaving. All the buntal straw from which hats are made in Lucban, Tayabas, is imported from the buri area, where no hats are made because there are no weavers. The hats made in other towns are usually finished in Lucban since skilled laborers are available. In the same way buri midribs are imported into Calasiao, Pangasinan, from other towns where the raw materials exist but a labor supply is not available.

By cheap labor is not meant labor which receives low wages, but labor which produces much in proportion to the wages given. Often labor which receives low wages is not cheap in the end, for it produces little wealth. Thus cotton cloths produced in India by poorly paid labor cannot compete with those of England produced by labor which receives much higher wages. An English laborer produces more in proportion to his wages than an Indian laborer, and English labor is therefore cheap. Labor must be skilled where machinery is used, and the supply should everywhere be large and constant. If there are many laborers one day and few the next, no enterprise either manufacturing or agricultural can be carried on. As labor is the most important of the factors which determine the cost of an article, so it is one of the most important which determine the location of industry.

In the past Filipinos have done little work with tools or machinery. The artisans of the Philippines have been Chinese carpenters, cabinetmakers, and masons. Filipinos have been most employed as tailors, silversmiths, goldsmiths, painters, blacksmiths, and in building work necessitating climbing to a considerable height. They are now taking up other trades to an ever increasing extent. In provinces where all skilled workmen formerly had to be imported, a sufficient local labor supply on normal building operations is now available. The implements and methods are primitive ones adopted from the Chinese.

The Filipinos have proved themselves especially efficient sawmill hands, cigarmakers, and tenders of cigarette machines. They are also proving satisfactory in machine shops, shipbuilding and repair shops, railroad work, and the relatively numerous factories now established in Manila. The fact that capitalists are investing money in factories dependent on Filipino labor is an encouraging sign.

The problem of training a sufficient body of men skilled in the use of tools and running machinery is especially difficult here because the Filipinos have been agriculturists. Their proficiency in handwork, however, has made it easier to build up a class of Filipino artisans such as is now being formed in factories and Insular and Federal shops. The schools are turning out trained artisans from trade schools and are teaching woodworking and other arts and trades in the general course. They have assisted greatly in the change of feeling toward trade and factory work, so that these are coming to be recognized as honorable and dignified methods of earning a living. In modern industrial nations it is felt that conditions of apprenticeship in the workshop or factory are not such as to give all the training necessary to those who are to engage in trade and industry. They are one-sided and imperfect. Technical schooling is becoming more necessary for the training of workers. Sometimes this is given in the factories; more often it is left to schools. The present demand for skilled labor in the Philippines tends to enhance the importance of technical education here.[1]

The idea of trade and labor unions showed itself in the Philippines early in the present century. Unions are combinations of labor, which try to meet the concentration of power in the hands of employers (an outgrowth of the factory system) by a similar concentration on the part of the employed. Unions do not exist for the purpose of striking. The strike is one of the means by which they try to obtain their ends. The modern unions of the better sort have for their objects the protection of the worker against encroachment by employers; the uplift of their members; the raising of their standard of living; an increased wage; and mutual insurance for sickness, accident, or death. In their relations with employers unions resort to discussion, contract, arbitration, and sometimes to the strike.

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[1] The typographical trades in the Philippines offer an excellent example of the success of Filipinos as skilled workers. In the Bureau of Printing, of the 466 employees over 93 per cent are Filipinos. Their work has received the highest praise from authorities (*Annual Report of the Director of Printing*, 1912).

The labor unions established in Manila in 1901 and 1902 under the auspices of a general labor union or federation were formed by a group of men, not laborers themselves, for personal and political ends. They had none of the objects noted above, and illustrate the mischief that false leaders may accomplish with a body of partially ignorant workers. The federation was disbanded by the government a few months after its establishment because of its seditious tendencies.

A new organization similar to the first one has been established and has managed to keep alive, but its activities have not been effective because of its complex organization and the fact that it has tried to do too much at once. Meanwhile trade unions — namely, unions of those who belong to the same trade — have flourished under autonomous management, and have proved to be more useful than the federation because they have been more easily managed and have been able to frame different policies to suit the various needs of the separate groups of workers. To-day they are the ones that uphold the interests of the laboring class.

The "Union de Tabaqueros de Filipinas" is the largest and strongest union. The machinists' and seamen's unions also are strong organizations. There are also smaller trade unions. Successful and unsuccessful strikes have been carried on, but the tendency to strike is becoming less strong. To-day trade unionism rather than general labor unionism is the tendency.[1]

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[1] I am indebted to Mr. Conrado Benitez for data on unions in the Philippines. *Bulletin No. 58*, Bureau of Labor, Washington, D.C., can be consulted for details of the early history of the movement.

4. *Low cost of transportation.* Manufacturing cities must be near their markets, or connected with them by some means of cheap transportation, so that their products can compete in price with the same articles manufactured in other places. Cheap methods of interisland transportation have made Manila and other ports of entry successful manufacturing centers. Better communication with Europe and America will do much for Manila as a factory city.

5. *Capital.*[1] Increase in manufacture and accumulation of capital are coincident. In the transition from housework to

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[1] Capital is that part of wealth which is used for the production of more wealth. Wealth therefore is or is not capital according to its use. Thus the fodder given a carabao is capital because the animal helps to produce wealth, but that given to a race horse is not capital because no wealth is produced by the race horse. A building used as a factory is capital, but one used for a clubhouse is not capital. Food is the most simple form of capital. At the end of the harvest the farmer has enough food to last him for a number of months. That is his wealth. He may or may not use it as capital; if he is idle, it is not capital; if he produces, it is capital.

The growth of capital is well illustrated in the economic stages exemplified by the Negritos, Subanuns, and Mountain Peoples. The amount of wealth in the form of implements, tools, and food employed to produce further wealth increases with each culture stage.

The growth of capital is the result of saving by the individual, as is often illustrated in the increase of animals. Batangas Province furnishes instances of families raising a few chickens, selling them for a small sow, raising the sow and a litter of pigs, which are traded for a calf. Thus a work animal is obtained. The matter of saving has already been discussed in connection with land tenure, and the impetus toward ownership of a farm which the possession of a work animal gives the tenant has been related. Saving is the great law of capital.

The forms which capital takes can be grouped as follows:

1. Productive improvements upon land.
2. Buildings, such as barns and factories, devoted to productive industries.
3. Means of transportation, such as roads, canals, railroads.
4. Raw materials.
5. Auxiliary materials, such as coal and lubricating oils.
6. Tools and machines.
7. Domestic animals.
8. Money weights and measures.
9. Stocks of goods in stores and warehouses.
10. Books, instruments, etc.

Like the word "wealth" the word "capital" has other meanings besides it economic one. From the viewpoint of the individual, capital consists of al his possessions which bring him wealth. Thus a note or mortgage is commission work we see the gradual emancipation of the worker from the soil, and the growth of capital. The looms, yarn, tools, and implements of household weavers are capital; so are the advances of food and material made by brokers. In the factory system complete emancipation is effected, and the laborer becomes dependent upon the capital of others. The availability of such capital therefore helps to determine the location of factories.

The capital possessed by Filipinos is not large and is tied up in agriculture. Most of the capital invested in Philippine manufactures is foreign, and any great increase in manufacturing must result from foreign capital, for even with great saving Filipinos cannot soon accumulate enough surplus wealth to finance large enterprises. There is no doubt that the Filipino can save. Such primitive Malays as the Bontoks often have in their granaries the rice crop of five years before. The Ilocanos are probably the most saving of the Filipinos. In Hawaii it is noted that Filipinos usually spend all that they first earn, and then settle down to regular work. When they find that they can earn more than enough to live comfortably they begin to save. Recently a good many have returned to the Philippines, paying their own passages and bringing with them considerable sums of money. Under present conditions greater savings and capital are being accumulated in the Islands. The deposits of the Postal Savings Bank may be taken as an index:

NUMBER OF FILIPINO DEPOSITORS IN THE POSTAL SAVINGS BANK

1908	1909	1910	1911	1912
2852	4927	8587	23,161	29,555

In 1911 and 1912 the number of student depositors increased in greater proportion than that of all others.

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capital to the holder. But from the point of view of political economy (that is, from the point of view of the country as a whole), notes, mortgages, and such commercial paper are not capital. Thus a mortgage on a factory is not capital to a country. The factory is the capital, and the mortgage merely shows that some one owns a part of it. Economic capital consists only of that wealth which produces more wealth. Interest is payment for use of capital, just as wages are payment for labor.

CHAPTER XVIII

EXCHANGE

Just as division of labor results in commerce between men, so commerce between regions arises from differences in geological, topographical, soil, and climatic conditions which cause one locality to produce certain articles cheaper and better than they can be produced elsewhere. Since each person produces but one commodity, he must exchange the product of his labor for articles he requires; since the inhabitants of a given place produce and export those commodities which they can obtain in greatest amounts, or which will bring them the greatest returns, they are obliged to import other products in exchange.[1] Commerce in the tropics consists of the export of raw materials to the northern temperate regions and the import of manufactured goods from those regions.

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[1] In the coconut region of Sariay, Tayabas Province, practically all food stuffs and manufactured articles are imported, since it is more profitable for the people to give all their attention to their coconut groves than to branch out into other industries. Hence all available land is planted to coconuts. Abaca, sugar cane, tobacco, and the coconut-palm flourish in the Philippines. Consequently hemp, tobacco, copra, and sugar are exported, while rice, cloth, machinery, flour, and other manufactured products are imported. So in most localities, certain things which are not produced at all, or not so cheaply as in other regions, are imported and paid for with those products to which the locality is adapted.

Commerce also arises from the habits of people. National habits spring, for the most part, from environment which creates peculiar material wants. These habits are most apparent when people move to other lands. Thus, the Americans and northern Europeans have brought to the Philippines their taste for butter, and the people of southern Europe their taste for olive oil. Tea must be imported into the Philippines for the consumption of the Chinese and other tea drinkers. Trepang (a sea slug obtained in the Philippines) is not consumed by Filipinos but by Chinese. Filipinos use many fruits, such as papayas, in a green state, while Europeans and Americans consume them only when ripe.

FOREIGN COMMERCE OF THE PHILIPPINES

The total foreign commerce of the Philippines in 1912 amounted to ₱209,739,632. From Chart XXXVI it will be seen that the volume of foreign trade of the Philippines remained fairly constant during the thirty-year period of 1872 to 1902, and averaged ₱75,000,000. This condition was changed with American occupation, and in the ten years between 1902 and 1912 foreign trade increased almost threefold.

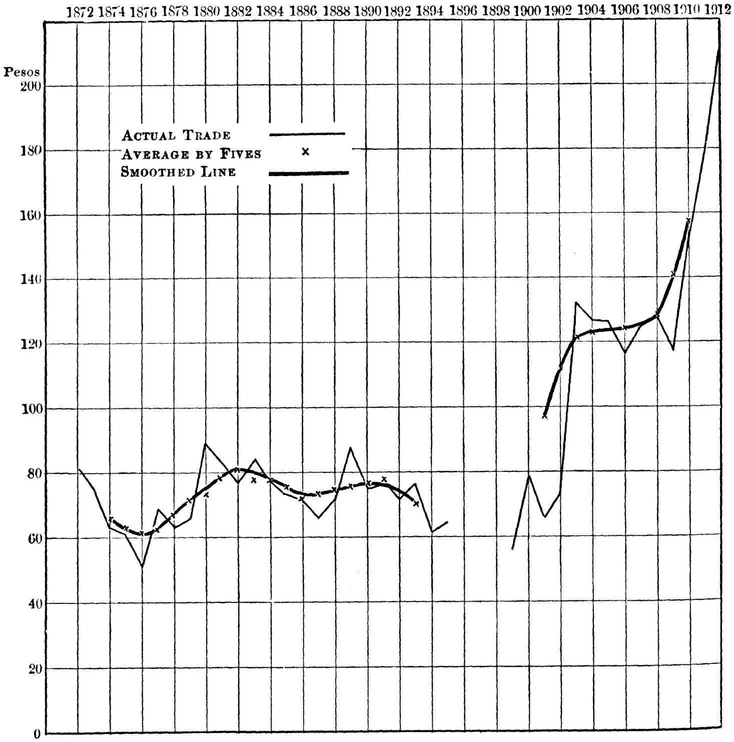

CHART XXXVI. TOTAL FOREIGN TRADE OF THE PHILIPPINE ISLANDS IN MILLIONS OF PESOS

Census and Customs Statistics

BALANCE OF TRADE

On Chart XXXVII both the imports and exports are indicated. It will be noted that during certain periods imports have exceeded exports and that during other series of years exports have been greater than imports. In 1912 imports were ₱109,099,960 and exports ₱100,639,672.[1] The difference is ₱8,460,288. This is called the balance of trade. The significance of the balance of trade is often misunderstood.

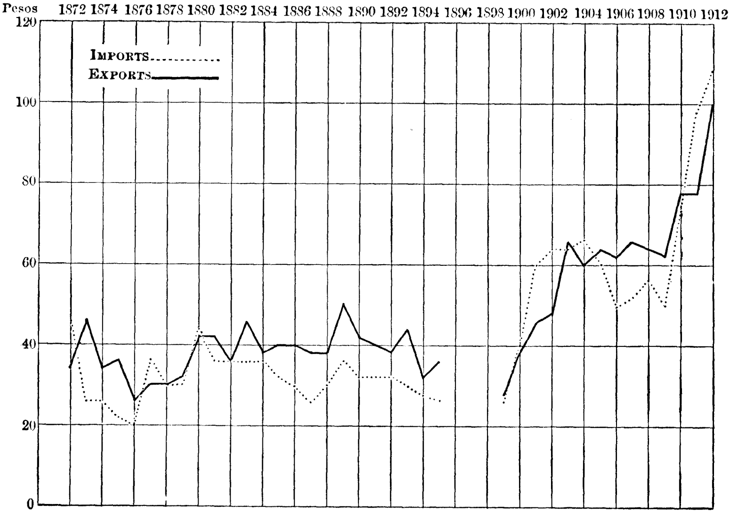

CHART XXXVII. FOREIGN TRADE OF THE PHILIPPINE ISLANDS IN MILLIONS OF PESOS

Census and Customs Statistics

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[1] A comparison of the trade of the following countries is interesting. The following are the figures for the fiscal year 1911–1912:

	Imports	Exports
Philippines	$ 54,549,000	$ 50,319,000
Uruguay	51,441,000	49,968,000
Venezuela	20,394,000	25,732,000
Chile	127,381,000	123,884,000
Cuba	108,007,000	128,224,000

Two centuries ago the Mercantilist theorists supposed that an excess of exports was favorable to a country and an excess of imports unfavorable. Such, however, is not the case, since other factors influence the balance sheet of the country.[1] These are tabulated below.

Items tending to excess imports	*Items tending to excess exports*
1. Imports.	1. Exports.
2. Receipt of a loan.	2. Repayment or an advance of a loan.
3. Interest on capital invested in other countries.	3. Payment of interest on foreign capital.
4. Earnings of native merchants abroad.	4. Profits of foreign merchants.
5. Donations received.	5. Donations given.
6. Profits of shipping.	6. Payments to foreign shipping.
7. Expenditures of foreign nations.	7. Expenditures made abroad.
8. Indemnities received.	8. Indemnities paid.
9. Travelers from foreign countries.	9. Travelers in foreign countries.[2]

In the long run the balance of trade of the Philippines should be "favorable." Excess exports should be sent away to pay (1) interest on large sums of foreign capital invested here, (2) profits of foreign merchants who control the trade of the Islands, (3) charges for the use of foreign shipping, (4) money taken or sent away, (5) expenditures of travelers and students abroad.

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[1] That both rich and poor countries may have an "unfavorable" balance of trade or a "favorable" balance, may be seen from the following figures:

	IMPORTS	EXPORTS
Austria-Hungary	$ 641,576,000	$ 483,773,000
Belgium	832,406,000	682,418,000
Canada	521,448,000	290,224,000
China	306,812,000	245,538,000
United Kingdom	3,309,987,000	2,204,322,000
Brazil	256,942,000	325,271,000
British Indies	449,583,000	719,334,000
United States	1,653,265,000	2,170,320,000

[2] Bastable's "The Theory of International Trade."

On the other hand, the expenditures of the United States government for supplies for its troops and vessels stationed here and for payment of these troops tend to reduce the excess of exports, while the inflow of foreign capital, which is now taking place, still more greatly increases the imports, and even results in "unfavorable" balance. This may continue for some time.

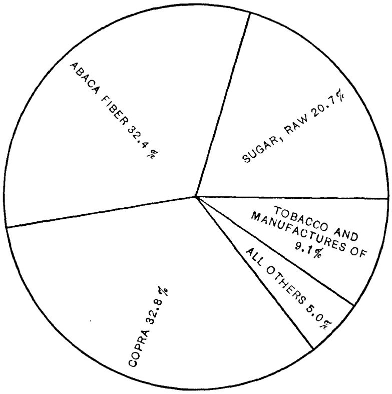

CHART XXXVIII. ARTICLES INCLUDED IN THE PHILIPPINE EXPORT TRADE

Percentages for 1912

The fact that a rich country like the United Kingdom has an "unfavorable," and a poor country like India a "favorable," trade balance shows that these words are misnomers when so employed. Excess imports and excess exports are results of complex conditions, and either may indicate a healthy condition of foreign commerce.

PHILIPPINE TRADE WITH THE UNITED STATES

The character of exports from the Philippines is shown in Chart XXXVIII. The proportion of each of the four principal exports in the export trade from year to year is indicated in Chart XI. In Chart XXXIX can be seen the character of the average imports.

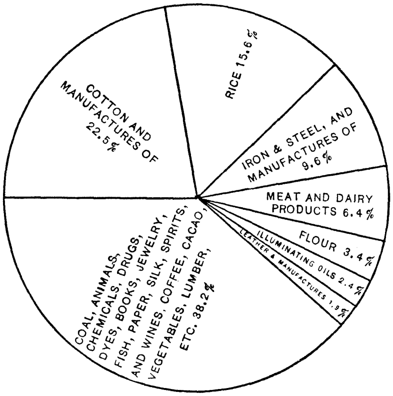

CHART XXXIX. ARTICLES INCLUDED IN THE PHILIPPINE IMPORT TRADE

Averages of ten years in percentages

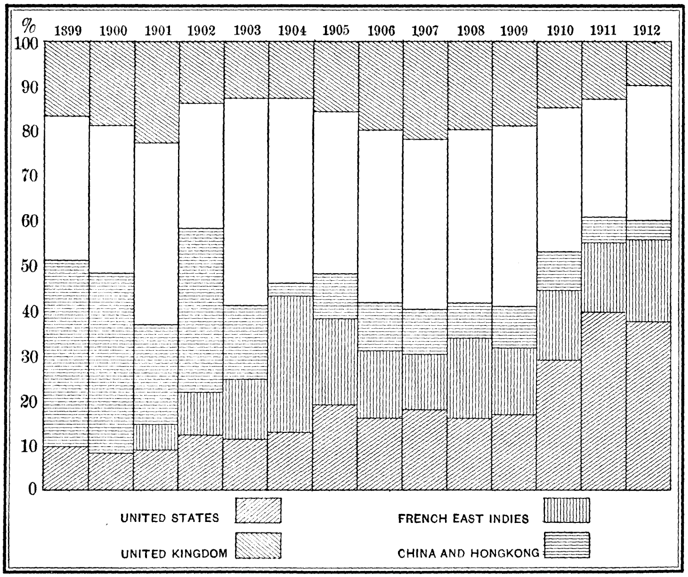

CHART XL. COUNTRIES PARTICIPATING IN THE IMPORT TRADE INTO THE PHILIPPINE ISLANDS IN PER CENT OF TOTAL IMPORTS
Customs Statistics

The part which the different countries have in the trade of the Philippines is undergoing change. From Charts XL and XLI it can be seen that the relative share of the United States has greatly increased, while that of the other three chief participating countries has decreased. In the last thirteen years the share of the United States in the export trade from the Islands increased from about 20 per cent to over 40 per cent, and that in the import trade from less than 10 per cent to almost 40 per cent. In considering these percentages it must be remembered that the total trade of the Islands has increased greatly. The actual share of countries is indicated in Charts XLI and XLIII. The increased trade between the United States and the Philippines is largely due to free trade relations.[1]

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[1] Free trade between the Philippines and the United States, with certain limits on tobacco and sugar and on rice, was established in 1910.

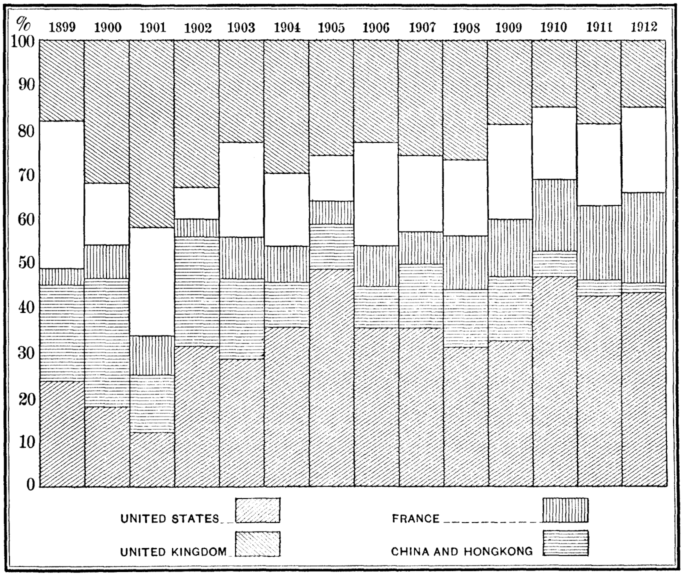

CHART XLI. COUNTRIES PARTICIPATING IN THE EXPORT TRADE FROM THE PHILIPPINES IN PER CENT OF TOTAL EXPORTS
Customs Statistics

A comparison for the years 1909 and 1912 indicates the results of the preference given Philippine products.

	Fiscal Year 1909	Fiscal Year 1912	Ratio of Increase %
Total imports	$27,794,482	$54,549,980	96
Total exports	31,044,458	50,319,836	62
Total trade	$58,838,940	$104,869,816	78
Imports from United States . . .	$ 4,696,178	$20,770,536	342
Exports to United States	10,256,600	21,619,686	111
Total trade with United States .	$14,952,778	$42,390,222	183

While total Philippine exports increased 62 per cent, those to the United States increased 111 per cent. Total Philippine imports increased 96 per cent, but the share of the United States increased 342 per cent.

The importance of total Philippine trade with the United States in comparison with that of other countries is indicated below in figures from United States Customs reports:[1]

	Imports into the United States	Exports from the United States
Philippines	$23,257,000	$23,736,000
Austria-Hungary	16,713,000	22,388,000
Russia (in Europe)	20,600,000	21,508,000
Spain	21,900,000	25,000,000
China	29,573,000	24,366,000

The growth of trade between the United States and the Philippines is shown on Chart XLIV (Insular Statistics). It will be noted that before the present tariff relations became effective, exports to the United States exceeded imports from that country. In 1911 and 1912 they were practically equal. This exchange of goods is very beneficial to both countries, as a study of the export figures will show. The United States is a large importer of tropical raw products for manufacture and an exporter of manufactured goods suitable for use in the tropics. The Philippines supply many of these raw materials and demand the manufactured products. Of the exports from the Philippines to the United States almost 75 per cent are raw or partly manufactured, and of the 25 per cent ready for consumption a large part are products of handicrafts which cannot be produced in the United States. Of imports from the United States about 90 per cent are manufactured and food products ready for consumption, and about 10 per cent are raw and partly manufactured products. The volume of the export trade from the United States to the Philippines in 1912 ($23,736,000) was slightly greater than its exports to all Africa ($23,507,000), or to Russia in Europe ($21,500,000); it was about the same as its exports to China ($24,361,000) and to Spain ($25,000,000); it was almost twice the exports to Central America excluding Panama ($13,534,000); its exports to Brazil were one and one half times as great ($34,678,000), and to Mexico two and one third times as great ($52,800,000). In 1899 the exports from the United States to Mexico were $25,483,000; in 1903 the exports to Cuba were $21,761,000; in 1910 those to Japan were $21,959,000. Exports from the United States to all Asia were less than $20,000,000 ten years ago.

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[1] Figures on page 319 are from the *Insular Collector of Customs*.

The Philippines and the United States are seen to be reciprocal producers and consumers, with a rapidly increasing trade, further strengthened by the mutual elimination of trade barriers (tariffs) raised against other countries.

GROWTH OF FOREIGN TRADE

The demand for manufactured products is rapidly increasing in the Philippines. Industrial expansion is causing larger exports, and the purchasing power of the people thus enhanced results in greater imports for consumption.

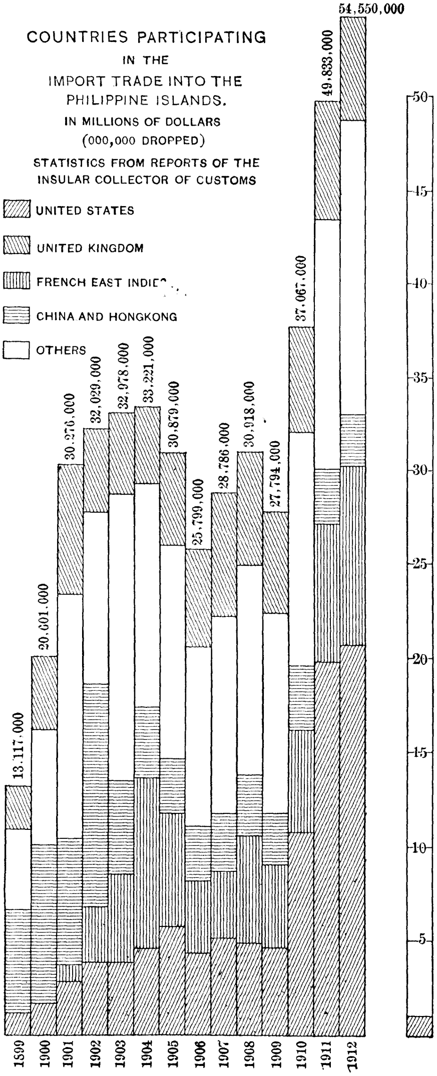

CHART XLII

The per capita foreign purchasing power of certain tropical countries can be determined from the following table in terms of exports per capita:

Country	Exports per Capita
India	$ 2
Philippines . .	4
Java	4
Mexico	9
Porto Rico . .	36
Cuba	75

The per capita export of Cuba can be duplicated in the Philippines. Since large areas of unused lands are available, capital is being encouraged to enter, and Filipinos are proving themselves efficient laborers. Moreover, a large market for Philippine products exists in the United States.

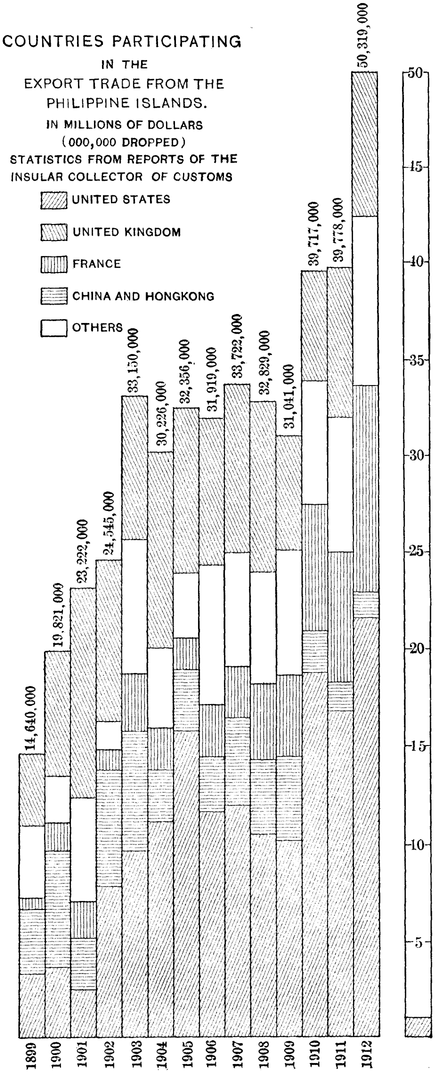

CHART XLIII

Domestic Commerce of the Philippines

The amount of a country's domestic commerce depends on the territorial extent of the country, especially from north to south, the consequent different climatic and soil conditions, and the number of different products raised. The United States

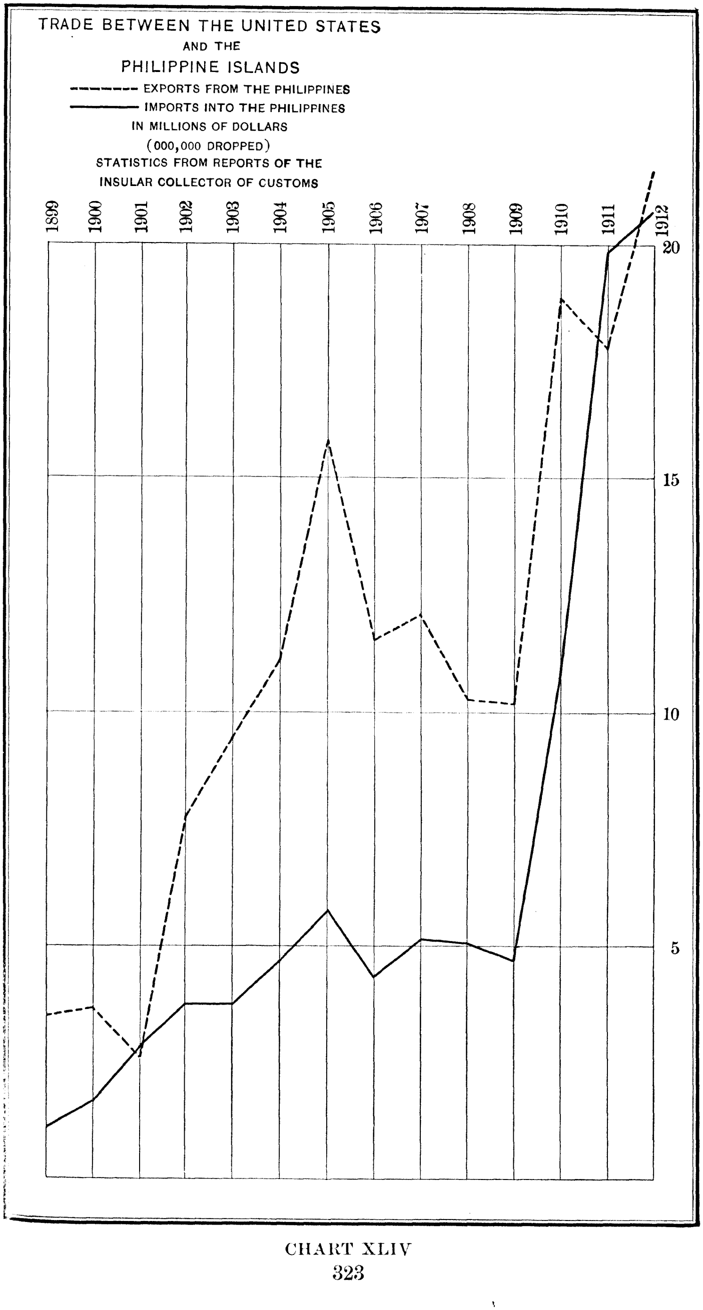
TRADE BETWEEN THE UNITED STATES
AND THE
PHILIPPINE ISLANDS
-------- EXPORTS FROM THE PHILIPPINES
———— IMPORTS INTO THE PHILIPPINES
IN MILLIONS OF DOLLARS
(000,000 DROPPED)
STATISTICS FROM REPORTS OF THE
INSULAR COLLECTOR OF CUSTOMS
1899
1900
1901
1902
1903
1904
1905
1906
1907
1908
1909
1910
1911
1912
20
15
10
5

CHART XLIV

has so great diversity of production because of its extent that it could be self-supporting if necessary.

The domestic commerce of the Philippines is limited because there is little diversity of production for domestic consumption. Only a few regions raise crops for export to other parts of the Islands. Such are the orange regions of Batangas, the tobacco district of the Cagayan, and parts of the rice region of the Central Plain of Luzon. In a few places household articles are manufactured for domestic trade, as the cotton cloths of the Ilocanos, the hats of Mavitac and Cavinte, Laguna Province, and sleeping mats from several towns. However, most regions of the Philippines are self-sufficing or produce crops for export from the Islands; hence domestic trade consists of moving the export crops to the ports and distributing imports. In districts in which subsistence farming obtains, Ilocos Norte for example, the amount of imported goods consumed by a family is very small indeed. The Ilocano agriculturist is not a commercial farmer; he produces just enough rice, corn, beans, chickens, and hogs for his own needs, raises enough sugar to supply himself with basi and enough cotton to be spun into cloth for his family's clothing. On the other hand, in a region devoted to export crops almost everything consumed may be imported.

TRANSPORTATION [1]

Inland transportation in the Philippines is carried on over trails and roads and by water and railroads. Trails are found in the less developed parts of the Islands, and particularly in the mountainous regions. Human beings are employed as porters (cargardores) to a great extent, and horses and carabaos are also used. Such transportation is expensive, and the amount of product that can be carried is limited. The building and maintenance of good roads accounts in no small measure for the recent economic development of the Philippines. The increase in first-class roads can be determined from the following table, which gives the total existing kilometerage of designated first-class roads in all provinces:[1]

---

[1] In order to be efficient, transportation must be cheap, reliable, and rapid. Transportation must be cheap or goods cannot always be sold in their proper market. Thus in the year 1910 a large part of the orange crop in Batangas could not be brought to market on account of the bad roads from Tanauan to the railroad. The cost of transportation over the road was so great that the price received for the oranges would not have repaid the farmer. Transportation must be reliable in delivering the goods both in good condition and on time. Much merchandise is lost in the Yangtze-kiang through the Ichang

1908	395.0 km.
1909	551.5 km.
1910	914.5 km.
1911	1424.3 km.
1912	1780.3 km.

In addition there were in 1911 some 1000 kilometers of second-class and 3000 kilometers of third-class roads. Sleds and carts with narrow, tired wheels are disappearing. Carts drawn by carabaos or cattle are used for heavy roads, and "caratellas" pulled by horses for light loads and passengers. Automobiles are being employed to an increasing extent and on good roads effect a saving in both cost and time.

The cost of transporting 100 kilos for one kilometer by these various means has been estimated by J. C. Scott, Head Teacher, Masbate, as follows:

Over good roads

By cargadores	₱0.50
By carabao back	0.15
By carts	0.04

Over bad roads

By cargadores	₱0.60
By carabao back	0.17
By carts	0.17
By sleds	0.15

---

gorges, because boats must pass over dangerous rapids, and several are overturned each year. If merchants are expecting goods on a certain date, they may lose considerable money if they arrive late. In the case of perishable goods, such as fruits and vegetables, transportation must be rapid.

[1] Data furnished by the Bureau of Public Works.

Transportation over a poor road during the rainy season may be five times the rate of the dry season. Everywhere excellent examples of reduction in the cost of transportation by the building of good roads are available. In many cases the new rate is half or even a fifth of the former tariff.[1]

The construction of a railroad into a community nearly always results in an industrial awakening. This has been seen in many parts of the Islands which have been recently connected with a market by a railroad. There are now in the

CARTS ON A FIRST-CLASS ROAD

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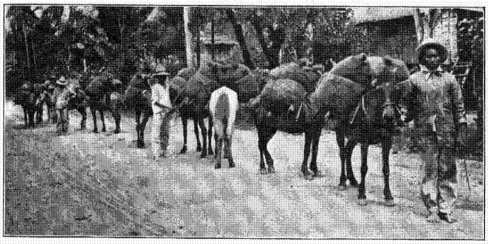
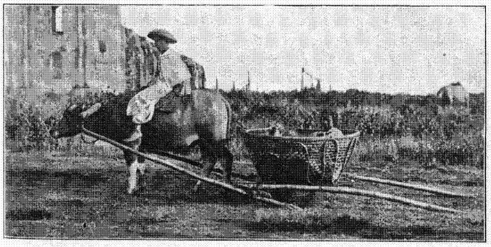
[1] If a place is connected with the market by poor transportation, the cost of the articles imported will be correspondingly high. All products have a certain price in the market. A section having good transportation facilities can send its products to the market at little cost, but one which has poor facilities must pay dearly for carriage. Thus, if the market price of a certain grade of abaca fiber is 10 pesos per pico, a town which has good transportation facilities pays 1 peso per pico to get its products there, while another locality connected by poor roads will perhaps pay 5 pesos per pico. The gross profit in the first case will be 9 pesos, and in the second case only 5 pesos per pico, and abaca will have a higher price in the first locality.

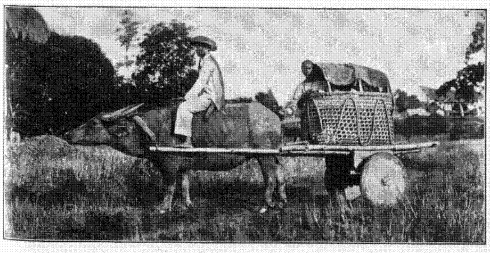
Therefore, poor transportation increases the price of imports and decreases the price of exports, and good transportation decreases the price of imports and increases the price of exports. As has been shown, the export of abaca fiber from mountain regions ceases when the market price falls, since the cost of transportation is not covered.



A Pack Train from the Highlands



A Bamboo Sled



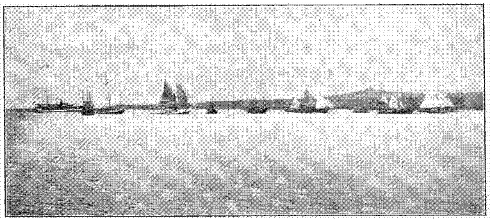
A Primitive Cart

PHILIPPINE TRANSPORTATION

Philippines about 1000 kilometers (625 miles) of railroad, of which 715 kilometers have been constructed during the last few years. One fourth of the population is served by railroads. Ownership of railroads is an important consideration in all countries. If a community is connected with its market by a railroad which is poorly managed or which charges high rates, the community will suffer. In Europe railroads are owned for the most part by the respective governments. In the United States and many other new countries the railroads are owned by private capital (corporations), although the government attempts to exercise a control over them in order that discrimination in prices against certain communities may not occur. In the Philippines the railroads are owned by private persons, but arrangements have been made eventually to bring most of the new mileage into the possession of the government. These new railroads are not only opening up to commerce regions which were previously backward on account of lack of transportation facilities, but are also offering quick and cheap means of travel so that the people of the regions affected are becoming

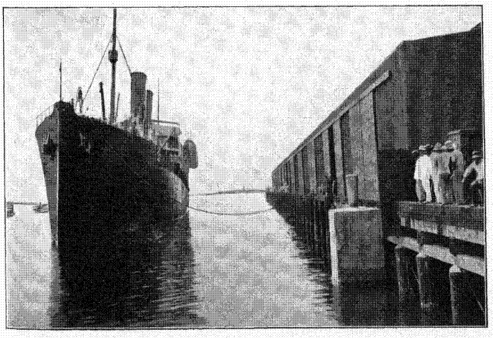
AUTO TRUCKS IN MANILA

less provincial and more progressive, and labor is becoming more mobile. Filipinos have shown that they enjoy travel.



SHIPS ALONG A PHILIPPINE COAST

The cheapest form of transportation, though not the quickest, is by water. Waterways require much less labor and less power to propel a given weight than do roads or railroads. Most Philippine products intended for domestic consumption are carried to market in dugouts, lighters, launches, and small



A DOCK AT MANILA

sailboats. Much of the abaca fiber, copra, sugar, and tobacco is brought to the ports of entry by these carriers.

In archipelagoes, such as the Philippines, interisland communication is of great importance. Ocean vessels load and unload at the ports of entry. Smaller interisland steamers, sailing vessels, and other minor craft take the goods from these principal points and distribute them throughout the Islands, at the same time gathering the produce from the minor ports to be brought to the ports of entry for export. Such water communication needs only good roads and railroads connecting the shore towns with the inland parts of the Islands to make an excellent transportation system.

TRANSPORTATION CENTERS AND MARKETS

Communities grow where there are favorable agricultural and manufacturing conditions. They also exist where products can be easily gathered and distributed. Thus Manila is a transportation center, or center of commerce, where the products of the Philippines are gathered for export, and where imported goods are brought for distribution throughout the Islands. It is the natural outlet for the products of the Central Plain of Luzon and the Laguna de Bay region and a transhipment point for interisland trade of the Archipelago as a whole. Cebu is the port for the eastern Visayas (abaca and copra) and Iloilo for the western (sugar). Hongkong is a distributing and gathering point of northern Asia both by way of the Suez Canal and over the Pacific Ocean to the western coast of America. Part of the foreign commerce o Manila, Cebu, and Iloilo goes through Hongkong, and severa steamers are regularly engaged in carrying goods between thes points. The importance of this transhipment trade is decrea ing with more direct sailings from Philippine ports to Europ and the United States. Singapore is an important transporta tion center of southern Asia, whence the goods from Europ and eastern United States coming through the Suez Canal ar distributed, and where products are gathered to be sent to Europe and America. The Philippines receive some goods shipped via Singapore and send some of their copra and much rattan, resins, pearl shells, and the like for shipment through Suez. Zamboanga, the transportation center of the Moro Province, is in direct communication with Singapore.

Important transportation centers for interisland commerce in export products are:

Aparri and Lalloc for Cagayan Valley	Tobacco
San Pablo, Laguna Province	Copra
Lucena, Tayabas Province	Copra
Daet and Nueva Cacares, Camarines Province	Abaca and copra
Legaspi, Albay Province	Abaca and copra
Gubat and Sorsogon, Sorsogon Province	Abaca and copra
Romblon, Capiz, and New Washington, Capiz Province	Abaca and copra
Calbayog, Catbalogan and Borongan, Samar Province	Abaca and copra
Carigara, Palompon, and Baybay, Leyte Province	Abaca
Dumaguete, Oriental Negros Province	Abaca and copra
Cagayan, Misamis Province	Abaca and copra

In addition to these the following are important market towns for the gathering and wide distribution of products in the domestic trade:

Candon and Vigan, Ilocos Sur,	General market for large district
San Fernando, Union Province,	General market for large district
San Fernando and Guagua, Pampanga	General markets
Dagupan, Pangasinan	General market for province
Gapan, Nueva Ecija	General market for province
Calumpit, Bulacan	General market for province
Baliuag, Bulacan	General market for rice, hats, etc.
Pasig, Rizal	General market for province
Indang, Cavite	General market for highlands
Bauan, Batangas	General market for province
Pagsanjan, Laguna	Coconuts, oil, areca nuts, fruits, hats, etc.
Ormoc, Leyte	Grain
Carcar, Cebu	Corn, eggs, fruit, etc.
Oton, Iloilo	General market for southern Panay
Jaro, Iloilo	General market for northern Iloilo
Calivo, Capiz	General market for Aclan Valley

In addition there are many other market towns on which a smaller region is dependent for interchange of products.

Markets are not continuous but are held at stated intervals, once or twice a week, for a period of from one to three days. The country people flock to these markets with their surplus products to sell or exchange, and merchants likewise come to buy, sell, and exchange. The transportation centers and markets are usually one of the following points: (1) the center of a rich agricultural district; (2) the head of navigation on a river; (3) the crossing or junction of railroads, rivers, and other means of transportation; (4) where goods must be transhipped, as from small to large vessels, or from land to water transportation, and vice versa; (5) a good harbor; (6) where a festival is observed.

Markets and Merchants

In primitive communication, exchange of goods between producers is effected at fairs or markets. Such commercial gatherings are found in all countries of the world. In the Philippines exchange occurs in the larger markets noted above, but more particularly in the small local markets found in most municipal centers and in many barrios. The poorest of these display only small quantities of rice, corn, vegetables, and sometimes meat. The largest contain meat (pork and beef), fish, vegetables, minor household necessities, domestic and imported cloths, chickens, eggs, bread, kerosene, rice, corn, pottery, cutlery, hats, mats, native sugar, tobacco, rope, fruits, salt, beverages (tubá and vino) and canned goods (salmon, sardines, milk, beef, fruits).[1]

In such markets producers often dispose of their articles directly to consumers for money or in trade. In general, however, the domestic as well as the export products of the Philippines are exchanged through merchants.[1]

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[1] These markets are now receiving special attention in order to improve their sanitary condition. Many municipalities have built, or are building, new sanitary markets, and it is thought that these will greatly assist in improving health conditions in the Islands.

The domestic commerce of the Philippines is mostly in the hands of Chinese merchants, while the foreign trade is controlled almost entirely by Europeans, Americans, and Chinese.

OUTSIDE A PHILIPPINE MARKET

The wandering traders are usually Filipinos, who deal in domestic products, although a relatively few are Chinese, East

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[1] The business of merchants is to gather the products of different persons and places, and distribute them to the consumers. Merchants stand between producers and consumers. Through the intervention of the middleman the producer is able to concentrate his effort on production.

The process by which Philippine hats reach the consumer in Europe and America will illustrate the system of marketing through merchants. In Lucban, brokers and wholesalers go from house to house buying hats, or they purchase the hats brought to them by the weavers in their employ. In Baliuag many hats are sold in the market, which occurs twice a week and to which the weavers bring their products for disposal. The hats so gathered by the merchants are bought by exporters in Manila and sent to import merchants in Europe and the United States, where they are again sold to factories or wholesalers, who in turn dispose of them directly or indirectly to retail stores. Thus they finally reach the consumer.

Indians, Syrians, and Japanese, who deal in foreign wares. Filipinos operate the smaller tiendas and market stalls. They are always the buyers of hats, embroidery, and other household products for export and usually those for domestic consumption. The Chinese are large importers and wholesale merchants in the ports of entry, keepers of small stores in all parts of the Islands, and owners of interisland steamers. By purchase, barter, and extension of credit they obtain most of the abaca, copra, sugar, and tobacco from small producers and sell to other middlemen or to export houses. They also trade in rice and corn in the districts in which these are raised in surplus. Occasionally they deal in household products for domestic consumption, especially hats. Often their stores are merely "side lines," run in connection with their buying activities, as convenient places to attract farmers with products for exchange or sale. It is noticeable that the Chinese merchants predominate in the Visayas and the Bicol Peninsula. They control most of the trade in Nueva Ecija, the Ilocano provinces, and the Cagayan Valley. In many parts of the Tagalog provinces natives control the largest part of the commerce. In a few places there are no Chinese. Taal-Lemery in Batangas is the most noteworthy of these.[1]

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[1] With the possible exception of Manila, Taal is the oldest known settlement of the Tagalogs. Pressure of population in the middle of the nineteenth century forced many of the people to emigrate to other provinces and islands, and the same causes have developed small manufactures and commerce. Taal and Lemery constitute one community, and after considerable losses by emigration still have about 40,000 people. In area these towns are small and have no large barrios, so that the bulk of the population is gathered at the mouth of the Pancipit River. This makes for a large proportion of educated and ambitious families. The people of Taal are industrious and thrifty and have an instinct for trade. It is impossible to say whence these qualities were derived, whether they came from Chinese ancestors or from competition with the Chinese, or from the keen struggle for existence in Taal. Probably the latter is the case. The Taaleños are noted for a certain hostility to strangers. This includes not only Americans and Chinese but also Filipinos of other towns. The list of permanent merchants in 1911–1912 shows 110 firms or individuals. Some of the partnerships consist of as many as 10 persons. About 300 persons are known to be connected with mercantile concerns which have a total capital of ₱190,000.

The causes which contribute to the success of Chinese as merchants in the Philippines are varied and intricate. The Chinese has proved himself a natural trader in all parts of the world. He is apparently able to please his customers in the Philippines. The Chinaman is content with a small profit, is saving, and accumulates capital. When the Spaniards landed in the Philippines the Chinese were already engaged in trade here and rapidly availed themselves of the opportunity brought by the newcomers to exchange the silks and finery of China for the silver of Mexico. Soon they established themselves in the domestic trade under the protection of the Spaniards, and in spite of periods of persecution and exclusion from the country have built up a large commercial organization consisting of importers, wholesalers, middlemen, retailers, and buyers, and a credit system extending through all of these. Thus the Chinese storekeeper can offer credit where the Filipino cannot. In their commercial efforts the Chinese have had little competition from Filipinos who (1) have lacked business initiative

an average per firm of ₱1727. The smallest capital employed is ₱500, and the largest ₱20,000. The total yearly purchases of these 110 traders amount to ₱270,940; the yearly sales to ₱343,780. The difference presumably represents the gross profit. Transportation charges will probably reduce this by 25 per cent. Fourteen of these firms operate tiendas in other towns of Batangas and other provinces. Seventeen others of these traders have tiendas in Taal.

Trade in Taal certainly makes for democracy. The social position of a merchant there is unquestioned. The merchant class controls the social and political activities of the town. Some of these merchants can speak no language but Tagalog and are anything but educated men, yet since American occupation they have grown rich enough to buy and sell the old landed aristocracy. The most notable example of business success here is the owner of the fleet of steamers. Twenty years ago he was a servant in the house of a Lemery family and now has about a dozen vessels plying between Manila and South Luzon and North Visayan ports, in addition to considerable interests in Manila. His fleet of steamers furnishes Taal quick communication with Manila and neighboring provinces. The Taal trading class is efficient. During the recent rice shortage Taal probably suffered as little as any town in the Islands which imports the bulk of its rice. The merchants here brought in sufficient supplies at all times and the price never became very dear. Taal people are always looking for a chance to buy land or a good location for a new store. (From a report by John H. Brown, Supervising Teacher.)

and ability and have not the saving instinct nor capital, (2) have had their entire means invested in agriculture, and (3) have wished too large profit. Filipinos of all classes are now evincing greater interest in commerce and industry. In many places their private commercial ventures are succeeding. In certain towns (as in the highland region of Laguna) the "turnuhan" idea appears in coöperative organizations of natives in retail stores and wholesale trade. The proportion of native women engaged in commercial ventures in the Philippines is greater than in most other countries.

The relation of merchants to the Philippine agricultural classes does not end with the mere exchange of produce for articles of consumption. They are in a position to advance new ideas in agriculture, to introduce and encourage new and remunerative crops, to increase the standard of quality, and to create new markets. The retail merchants, especially, have a great opportunity along these lines; but thus far, however, their effect on agriculture has been reactionary rather than progressive. Looking upon trade from the narrow viewpoint of immediate profit, they have taken from the small farmers by sharp methods and a pernicious credit advance all incentive to greater effort and production.[1] Buying without reference to grade, they have encouraged the production of inferior qualities of tobacco, abaca fiber, and copra.[2]

The use of more enlightened methods by retail merchants would hasten the industrial progress of the Philippines.

WANDERING TRADERS

The wandering traders are mostly Filipinos. In many well-populated districts peddlers are found who hawk their wares over a limited area. Many permanent merchants also send out goods in care of employees. From a few regions, where pressure of population is great, wandering traders operate over an extensive territory. The principal regions visited by Ilocanos, Macabebes, Boholanos, and Taaleños are shown on Chart XLV. The Mariquina shoe peddlers and the peddler of Iloilo are also encountered in a number of provinces, but these people do not wander far from their homes.

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[1] See this chapter under the heading Credit.

[2] See chapters on these products.

Ilocano traders are often small landowners who lease to others and sometimes mortgage their holdings to raise the necessary capital to finance their trading ventures. They go in great numbers each year to Cagayan during the tobacco harvest. They sell Ilocano cloth, sugar, and native hats, and usually bring back tobacco, preserved fish, nito, rattan, and lumber to vend in their own towns. Money passes twice, and two profits are thus made. Very little barter occurs in these enterprises. The merchants belong to the middle class, but take with them servants and dependents to peddle their wares. The commercial activities of the Ilocanos in the Central Plain of Luzon are not so important.[1]

In Macabebe there are from 800 to 1000 individuals engaged in traffic with other provinces. About two thirds of this number are engaged as cargadores, who are paid from ₱10 to ₱15 per month besides subsistence.

Few of these traders, hardly 10 per cent, have money of their own invested in their enterprise. About 50 per cent of the whole capital is furnished on mortgage by a few wealthy men of Macabebe, with an annual interest ranging from 25 per cent to 60 per cent; the rest is obtained from the Chinese merchants in Manila in cloths and other goods, in many cases without any security. Many of these traders are small landowners whose relatives till their holdings in their absence.[2]

Wandering traders also go out from Taal, and many of the permanent merchants there send out wandering representatives.

The activities of the Boholanos in northern Mindanao may be judged by the following description:[3]

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[1] Report of G. Glenn Lyman.

[2] From a report by Benito Pangilinan.

[3] By Lewis S. Thomas, Supervising Teacher, Misamis-Surigao.

A party of Boholanos leave their town in a banca owned in common. The men are usually owners of small amounts of land at home. They leave originally with cloths of various kinds, steel articles of their own manufacture, nipa hats, ticog hats, loom-woven mats, fighting cocks, and general novelties. The first point of venture is generally some place where they can dispose of their goods for cash. They may lay up their banca in a creek and travel on foot, selling as they go. When they have sold out, or believe that the trade will not absorb more, they take their departure for some fishing point. In January, Cagayan and Tagoloan are the objective points. There they lay in a load of salted "hipon," sometimes catching the fish themselves, and then go on to Camiguin to sell it, and thence proceed homeward. Another banca may go to the mouth of the Agusan. Here they barter for salt fish as well as sell goods. If time permits they may go to some point where salt fish is needed and sell their stock. At Opol, for instance, they will load up with earthen pots which are salable all over the coast. They cost from ₱0.02½ to ₱0.10 and sell at from ₱0.05 to ₱0.20 in Camiguin. This is considered a good profit. A banca sells out its fighting cocks along the coast from Baliango to Iligan or Initao. Then sail is set for Cagayan. Here the men may go up into the Bukidnon District to buy mats of sud-sud, which yield a profit of 100 per cent in Bohol. Another banca may sell out its goods at Medina and lay in tobacco, which is sold at Cagayan and the money converted into salt fish. So the process goes on. At last they return to Bohol loaded either with money or salable articles.

The system followed in financing these expeditions is explained in the following description[1] of the barrio of Guiwanon, town of Maribohok, Bohol:

> An old man is the financier of the wandering merchants of this barrio, of whom there are more than 100. For more than twenty-five years he has been in the business of advancing them money and equipping them for their journeys, at the rate of 20 per cent for the money advanced and one third of the net profits of the venture. The barrio of Guiwanon is one of the most prosperous communities on this coast.

MONEY

Barter, the exchange of goods for goods, does not exist in the Philippines to the extent one would at first suppose, considering the large number of primitive people found here. It is still carried on in trade with the savages and semicivilized

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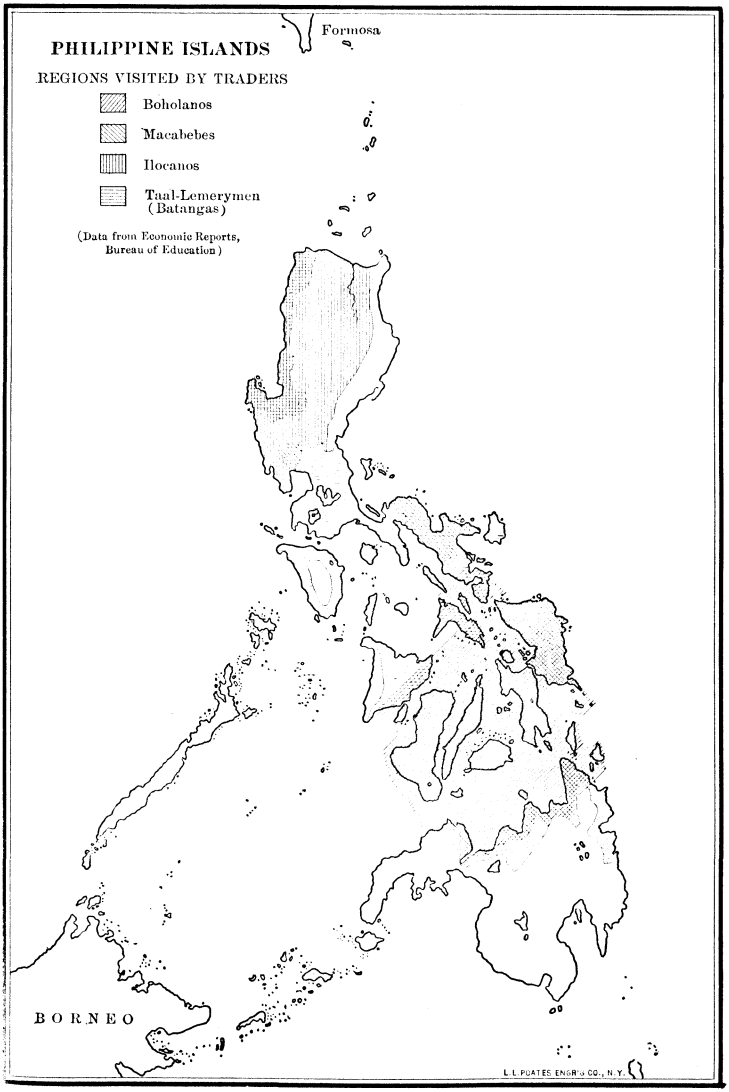
[1] By Jacob G. Lang, Supervising Teacher.


PHILIPPINE ISLANDS

REGIONS VISITED BY TRADERS

(Data from Economic Reports, Bureau of Education)

CHART XLV

tribes.[1] Yet even among them money is now employed as freely as in the lowlands. It is only in the most remote districts, where the influence of the government is felt the least, that barter is still the rule. In the Sulu Archipelago the only markets which the government has anything to do with are located at Jolo, Siasi, and Bongao. Almost every headman has a market day in his district at least once a week. On these days the people gather from miles around, bringing tapioca, fish, betel nuts, and fruits. These they exchange for whatever they need. Often a person with money can buy absolutely nothing here. Exchange is the custom in all the markets, but in the three markets named above, money is accepted as readily as exchange, for the reason that the markets are larger and it is an easy matter to turn the money into the article needed.[2]

Among Filipinos barter is carried on in the markets and to some extent in the stores. Often chickens, eggs, and small quantities of farm produce are exchanged for oilcloth and the like. Barter is quite important in the marketing of export crops by small producers. These people often pack their tobacco, copra, or abaca to the tienda and receive food, cloth, drink and other articles for it.

As merchants are middlemen between producers and consumers, so money is the medium which acts between products sold and products bought. An essential quality of money is that it must possess value. The articles first utilized as money by a people are those most valued by them. Thus throughout the Philippines rice was, and sometimes still is, used as money. Corn, pearl shell, and coconuts are less often so employed. In addition to its value, rice is also portable, is not easily destroyed, and can be divided. These are essential features of money, and are possessed by metals in the highest degree.[1]

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[1] Commerce undoubtedly grew out of the exchange of gifts. That remnants of this idea still exist in the Philippines is indicated by the following extract from the report of Lewis S. Thomas, Supervising Teacher, concerning the Bukidnons of Mindanao:

> Barter among these people cannot be carried on unless certain conventions of friendship are first performed. It appears in all business with these people, even the Christians, that to sell a thing merely for the money is not honorable. There must be at least the fiction of a bond between the parties. In purchasing the people will distinguish between barter ("bailo") and exchange by means of money. "Ambit" is another word that is used even in cash purchases and originally had the significance of a friendly act. "Palit" is the word for an out-and-out purchase for cash. The relationship between the seller and the buyer may thus be determined. While these distinctions are most marked in the mountains traces of them can be seen among the Christian population.

[2] From the economic report of H. E. Stanton.

When the Americans took over the government of the Philippines two currencies were found — the Mexican silver dollar and the Spanish-Filipino peso and fractional coins. The value of these depended on the silver in them. The coinage of Europe and the United States is based on gold, and as the relative value of silver and gold constantly changes, the value of " Mex " in United States currency fluctuated greatly. When silver was cheap, it took ₱2.66 to equal $1 in gold, and when it was dear it took only ₱1.98.

The differences in exchange from day to day were detrimental to trade, and a new Philippine currency based on gold was therefore coined. The unit of value in this currency is a theoretical gold peso consisting of $12\frac{8}{10}$ grains of gold nine-tenths fine. This is half the amount in the theoretical gold dollars of the United States. This gold coin is never made. The Philippine peso is silver, and the value of the metal in it has usually been less than the face value of the coin. The full face value is guaranteed, however, by the "gold standard fund," a reserve of over $7,500,000 kept by the government for that purpose. The Philippine peso therefore maintains a constant exchange value of $0.50 gold.[2]

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[1] Care must be taken to distinguish the mere bartering of rice for other products, from its use as money. As money it performs the triple function of a medium of exchange, a measure of value, and a standard of deferred payment. If rice is exchanged for another product, but the value of both is first reckoned in pesos, the exchange is merely barter. When rice acts as money, it is not only readily received in exchange for goods and given in exchange for other goods, but the value of other things, such as pigs, are reckoned in it, and debts are contracted in its terms and are paid with it.

[2] The value of silver rose a few years ago. The amount of silver in a Philippine peso was for a time worth more than $0.50, and people began shipping pesos and fractional currency to China. To stop this, the currency was recoined and the size and amount of silver made smaller.

Philippine bills are silver certificates issued by the Treasurer of the Philippines upon actual silver or gold coinage deposited in the Treasury. About ₱26,000,000 worth are in circulation. There are also over ₱5,000,000 worth of notes of the Bank of the Philippine Islands and ₱20,000,000 worth of silver and minor coins in circulation. The per capita circulation is ₱6.82.

Credit, Interest, and Banking

The amount of money necessary for the commercial needs of a country depends upon (1) the amount used as a medium of exchange; (2) the amount held as a cash reserve by individuals to insure solvency; (3) the amount of credit given, and credit instruments (checks, notes, etc.) used.

Professor Hadley [1] gives two distinct cases in which the use of little money and much credit makes itself felt.

> In very poor communities, where the obvious needs for consumption are great, money in the cash drawer seems an unnecessary luxury. People are apt to spend all they have, and trust to getting more when more is needed. In this way they overreach themselves. They leave too little for effective use as a medium of exchange. By spending every cent they possess, they hamper production and exchange by constantly keeping their cash reserves at too low a figure; somewhat as the improvident operative, who spends every dollar before he has earned it, keeps himself constantly in the power of credit stores which charge him an unfairly high rate for his accommodation. In a community of this kind we find an inadequate supply of money, a very low level of prices for cash, a much higher level of credit prices, and a commercial system so uncertain and cumbersome as to prevent people from serving one another most effectively and from selling their products in outside markets at the best advantage.
>
> Another cause of scant money supply is exemplified in communities of active producers. Such people spend their money, not for immediate personal consumption, but for various forms of capital which will tend to increase their wealth in the future. It is not because they are poor that they keep themselves scantily supplied with money, but because they hope to be rich by means of its investment. Where farms, railroads, factories, and other forms of productive enterprise seem to insure their owners a return of ten per cent, the temptation to use too much

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[1] Hadley's "Economics."

money in purchasing means of production and leave too little to serve as a medium of exchange is at times quite overwhelming. In such communities there is always an active attempt to develop a credit system which shall serve the place of money.

The first proposition is applicable to most parts of the Philippines, for there is found here a great deal of borrowing and extension of credit for consumption rather than for production. In retail trade the "vale," or promise-to-pay system, prevails and the results are exorbitant prices. Money lenders, buyers, and storekeepers lend money or advance products on promise of repayment in tobacco, abaca, sugar, copra, rice, or other products at prices much below their market value. Such transactions net the lender from 25 to 100 per cent interest, and the borrower is often as much in the power of the lender as in the kasama system of land tenure.

Even where tangible security is given, interest rates are high. The pawning of jewelry (in which form much of the surplus wealth of Filipinos has been kept) is a common way of securing credit. Even where mortgages are given on land, crops, animals, and other properties, interest rates, in all but the most advanced commercial communities, have been from 25 to 50 per cent on yearly loans, and as much as 100 per cent on short-time loans in small amounts. In Manila, where a good banking and credit system exists, loans on real property bear 8 per cent interest yearly.

Interest is a legitimate thing. Capital is productive, and its share in production is interest. No established agricultural activity in the Philippines can yield 25 per cent (much less 100 per cent) on the capital invested and provide a just share for labor, rent, and the profits of the manager. In view of the fact that much of the money borrowed and the credit extended in the Philippines is used for consumption (fiestas, to tide over lack of food, and the like) it is well to consider some of the legitimate purposes for which capital may be borrowed.

1. The merchant may borrow on goods he has forwarded but on which he has not yet received payment; or on goods

for which he has paid, or for which he wishes to pay and which are in transit or in stock. The action in both cases is in anticipation of selling the goods for the purpose of buying more goods.

2. The manufacturer may borrow to improve his plant; for instance, a sugar mill.

3. The agriculturalist may borrow to purchase more implements and animals, to extend his holdings or improve his land, to purchase seed, and plant and harvest his crop. He may borrow on his crop either before or after it is harvested, in order to hold it for a higher price and at the same time have funds with which to cultivate his land again. In these instances wealth is borrowed for the purpose of producing more wealth, and earns interest.

Credit is difficult to obtain, and interest rates are high in the Philippines because:

1. The amount of capital here is not great.

2. Much wealth is borrowed for consumption rather than for production.

3. Money lenders take advantage of the ignorance and antipathy of the borrowers.

4. Lack of clear title to lands, the chief form of wealth in the Philippines, prevents land from being good security for loans.

5. Lack of a banking and credit system results in wealth being hoarded instead of being used to finance productive enterprises.

The first four considerations have already been discussed. As merchants stand between producer and consumer, and money between seller and buyer, so banks stand between lenders and borrowers. The moneys reserved by banks are:

1. Those given for safe keeping for a long time, and for which the bank pays interest (savings banks).

2. Surplus moneys used continually in business and to secure solvency. These are deposited and withdrawn at frequent intervals by individual owners but keep at a fairly steady level in the bank (commercial banking).

Thus much surplus wealth of the community comes under the control of the banks and is utilizable for the basis of a credit system. The bank borrows it from many people, combines it, and in turn loans a portion of it to producers on security.

Up to the last few years all the banks of the Philippines were to be found in the ports of entry and were doing a business connected only with the export and import trade. The great productive agricultural districts were, and still are to a great extent, without banking facilities of a legitimate kind. The government has taken the lead in the extension of banking by founding the Postal Savings Banking System and the Agricultural Bank.

The object of the former is to encourage saving by providing a safe place to deposit small sums of money at a low rate of interest. The Agricultural Bank of the Philippine government receives sums on deposit at interest from the Postal Savings Bank, provinces, municipalities, societies, corporations, and private individuals, and loans money on agricultural lands and crops already gathered and stored. The money loaned must be used on the land for agricultural purposes. The object of this bank is to encourage agriculture by providing loans to farmers at a legitimate rate of interest. While the commercial banks have lately taken greater interest in financial banking, considerable difficulty is still experienced in financing sugar planters who wish to hold their crop for higher prices, and in securing funds for harvesting and moving the rice and other crops. Provincial commercial banking systems with either foreign or local capital are urgently required in the Philippines. It is possible that the Agricultural Bank will be allowed by law to enter this business.

PRICE

Theoretically, price is determined by demand and supply. Great demand tends to increase the price of an article, and small demand to lower it. Small supply tends to increase price, and large supply to lower it. This law is well illustrated by the dickering carried on in the Philippines. The seller places his first quotation above what he expects to get; the purchaser begins with a figure lower than he is willing to give. The one lowers, the other raises, his offer until the price is determined. Just after harvest, when rice is abundant, the price is cheap; at planting, when the demand is great and the supply limited, the price rises. In 1909 the production of radishes in Pasig was large, and their price became low. The next year few radishes were planted, and prices advanced. In Laoag the occupation of silversmithing was overcrowded until many smiths went to the Cagayan Valley, when the remuneration of those remaining was increased. Copra now offers an example of an article the increased supply of which has not kept pace with the demand for it, so that its price has steadily risen.

The price of indigo is relatively low because of the competition of large supplies of cheaper coal-tar colors. The discussion of the price of abaca fiber in Chapter V offers an excellent example of the adjustment of price by supply and demand. If the price of an article rises considerably above the cost of production, the result is a large output in anticipation of large profits; but the supply being increased above the demand, the price falls until increase in the demand thus created absorbs the augmented supply. In turn, the lower price discourages production, and the price again rises on account of smaller supply. At a given time the price of an article is determined by demand and supply, and in the long run the price approaches the cost of the article plus a reasonable profit.

The nearer that free competition is approached, the more readily do demand and supply adjust themselves. Ignorance, custom, and monopoly tend to prevent free competition. The high rates of interest charged in the Philippines are not only the result of great demand in comparison with the available supply of capital but are also the result of the ignorance of the people, who are taken advantage of by the lenders. Immense profits were once made on articles traded to the wild tribes. In selling to persons of wealth it is customary to charge high prices. In some parts of the Islands the law of supply and demand does not seem to operate, and prices are fixed by tradition. Extraordinarily high prices offered do not seem to stimulate production. Prices set by the old tobacco monopoly are still observed in certain parts of the Cagayan Valley.

An effective combination of sellers or buyers is a monopoly. Monopoly price is set by such a combination. In the old government tobacco monopoly the buying of tobacco was fixed by the officials. As explained in Chapter V, it is sometimes thought that the low price paid for abaca was the result of a combination of buyers. At one time a transportation monopoly existed in the Philippines, particularly in the abaca regions. A farmer having brought his produce to the coast had either to sell it at a low price to the steamship representatives or to keep it, as no other transportation could be had to Manila. In 1903, and again in 1911–1912, shortage in the crop caused large importations of rice. A few merchants "cornered" the supply and advanced the price far above what supply and demand would have placed it. This monopoly was broken by the government, which imported rice and sold it at a legitimate profit.

CHAPTER XIX

SUMMARY[1]

COMPARISON WITH FORMER EUROPEAN CONDITIONS

BEFORE THE INDUSTRIAL REVOLUTION

The economic life of the Philippines is to-day predominantly national, with much of the old town economy and even domestic economy remaining. The Philippines are an agricultural country, with an extensive supplementary household manufacture. In many respects conditions here resemble the agriculture, manufacture, and commerce of England and the Continent before the industrial revolution, about a hundred and fifty years ago.[2]

Until this period the general character of industry was much the same as in the Middle Ages, or even earlier. Both agriculture and manufacture were pursued still by primitive methods; the farms were small and the manner of cultivation unscientific. Indeed, in many parts of England there still remained the old "common fields," which dated back to the days of the Norman Conquest, and before it, and were cultivated by peasants who, in many respects, had not progressed much farther than their villein ancestors.

But the peculiarity of the tillage system was that each villager had his strips or patches of land in different parts of the common field — not in juxtaposition. This custom — doubtless a relic of primitive times — was the cause not only of endless inconvenience but of the slow development of the science of agriculture. Disputes were constantly arising concerning the boundaries of the strips or the method of cultivation, and there was no opportunity for any one who was cleverer than his fellows to follow out a course of his own, or to indulge in agricultural experiments. Much time was lost in going from one field to another.

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[1] Mr. Herbert W. Krieger assisted in gathering historical data.

[2] Adapted from H. de B. Gibbins's "Economic and Industrial Progress."

The domestic system was very general in England and on the Continent before the changes brought about by the industrial revolution. Manufactures were closely associated with agriculture, and the craftsmen spun and wove with spinning wheel and loom in their own houses, to which very often a small piece of land was attached. At one time the weaver had furnished himself with warp and weft, worked it up, and had taken it to the market himself for sale; but by degrees this system had become too cumbrous, and the merchants themselves gave out the yarn to the weaver, or in other cases got together a few looms in a village and had them worked under their own supervision.

Aside from the many villages, there were towns. Citizenship in these towns depended on the possession of a home and land. People who lived outside a town were not granted many rights that its citizens possessed.

The occupations of the townsmen were, of course, more varied than those of the villagers. In addition to agriculture, the townsmen carried on manufactures and trade. Trading was the principal thing that marked off the life of the townsmen as distinct from that of the villagers. Articles of home manufacture, such as cloth, leather, arms, and wood, metal, and leather goods, were sold; likewise foreign goods that were brought to the towns from the Continent were displayed for sale in the towns.

The so-called market towns disposed of the products of manufacture. The market towns sold mostly local produce. Town fairs, held at stated periods, were quite important for a time, and merchants came from far and near to display their goods. Such fairs were held at different periods so merchants could attend many of them.

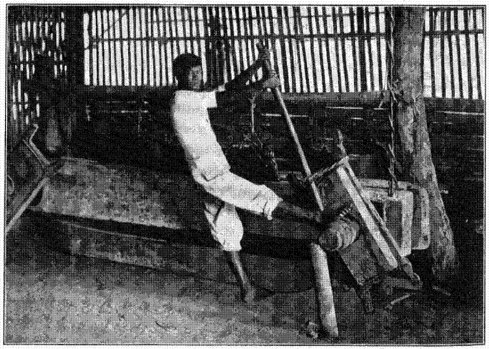
THE INDUSTRIAL REVOLUTION

During the eighteenth century, the old common fields, with their minute parcels of land, were gradually inclosed and turned into the trim and well-ordered private fields of the present day; but the old system was hardly yet dead at the close of the eighteenth century, though rapidly becoming obsolete. The last century, however, was remarkable for the growth and progress of agricultural and stock-breeding methods of a few pioneers. It was the beginning, also, of the age of the capitalist-farmer and of large holdings in place of the peasant cultivator and his tiny patches. Indeed, without capital and large farms it is difficult to see how improvement could have taken place, at least with such rapidity.

Improvement in implements, the introduction of machinery, new crops and rotation of crops, all received their impetus during this period. The first of the great mechanical inventions of the industrial revolution had to do with the spinning and weaving of cloth. The first successful invention along this line was the spinning jenny in 1764, which was able to spin eight threads at a time. Improvements on this machine greatly increasing its spinning capacity were finally combined in the mule.

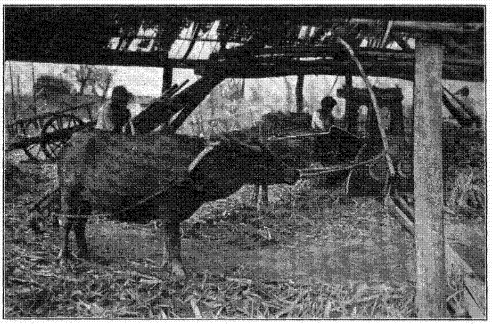
There remained to be invented a weaving machine that could keep pace with the increased possibilities in spinning. This was realized in the power loom. About the same time in America an apparatus was invented that was able to separate the cotton seeds from the fiber of the boll. Previously this had to be done laboriously by hand. Cloth manufacture was now free to go forward unhampered, were it not for one difficulty. It was found that the repeated inventions had so increased the size of the spinning machinery that it could no longer be placed in the houses of laborers. It was almost impossible to operate the machines by hand power. Special buildings were constructed, and horse power was employed. Later the buildings were placed by the side of streams and water power utilized. The first steam engine was used to supply power in a cotton mill in 1785. It had been used previously for other purposes.

It was now necessary for laborers to leave their homes and work in factories. They did not possess enough means to set up their own factories, and capital was supplied by merchants who had been successful or by the former owners of large estates. As domestic manufacture was no longer profitable, the displaced hand workers gave up their small landholdings and went to the factory towns as wage laborers, or devoted themselves solely to the cultivation of their small holdings. Often they sold and became agricultural laborers.

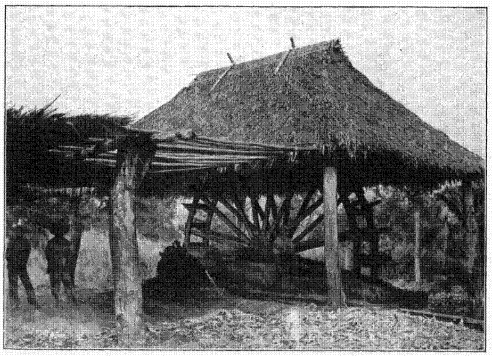


HUMAN POWER—AN OIL PRESS

Wood in England was well-nigh exhausted at the opening of the industrial revolution. As a result the smelting of iron was on the decrease. The use of coal in the reduction of the iron ore relieved the situation and stimulated new methods of coal mining. Its use as steaming fuel caused factories to be founded in the proximity of coal fields. Many canals were



An Animal-Power Cane Crusher



A Water-Power Cane Crusher

POWER

built, and great cities sprang up along them. Later, the construction of steam railroads brought further change in the localization of the great centers of industry. Cities that had harbor facilities were now connected by means of railroads with mines on the one hand and the agricultural and sheep-raising sections on the other.

The period of great inventions did not cease with the years immediately following the beginning of the industrial revolution, but have continued to the present time. The application of electricity to industry and the use of fuel oil for power are achievements of the modern age. Invention after invention is recorded annually in the history of the industrially progressive nations. The elements have been so completely mastered that the poorest laborer of to-day may in many respects live more comfortably and safely than could the lord of the manor in medieval ages.

RÉSUMÉ OF ECONOMIC ADVANCE IN THE PHILIPPINES

The Philippines are now going through an industrial revolution similar to that which took place in England, except that the impetus has come from without and that the achievements of other countries can be taken for guides and goals.

At the beginning of the seventeenth century, Manila had come to be the commercial center of the Far East, and Manila merchants were in control of the commerce between the Orient and Spain and the western world. The period of brilliant success of Spanish effort in the East was brought to a close through the petty jealousy of the Spanish merchants at home. Only one vessel was permitted to ply between Mexico and the Philippines. The freight charges on this galleon were very heavy and served to raise the price of products to such a degree that an importer or exporter of goods for the Mexican and Philippine trade could realize a profit of several hundred per cent.

Dating from the beginning of the seventeenth century, Spanish dominion both in Europe and in her colonies began to decline. After the Mexican trade ceased, the new outlet of Philippine trade was Spain itself. The route passed via Cape of Good Hope. Profits were now decreased, and trade became more extensive as it was no longer a monopoly. Some few foreign business houses began operations in Manila but under many restrictions. The wider market open to Philippine products stimulated the production of Manila hemp, sugar, and tobacco for export. In 1837 Manila became an open port for the ships of foreign nations. The cultivation of the staple export crops became still more extensive, and coffee and several minor crops, such as coconuts, made their appearance. In 1855 Iloilo and Zamboanga, and in 1863 Cebu, became ports of entry. These concessions to foreign trade were accompanied by a liberalizing of the customs duties. The prices of the export crops had so increased that it became profitable to the planter to introduce the cultivation of them and to purchase much of the rice required for the food supply.

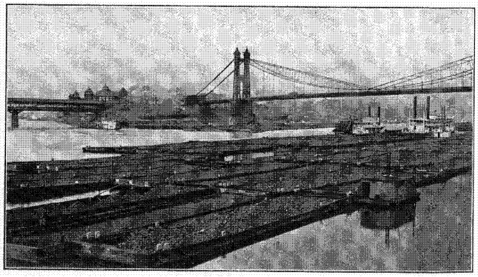
The opening of the Suez Canal greatly stimulated the trade relations of the Philippines by shortening the distance between Europe and the East, and gave the Philippine planters an opportunity to compete with the more favorably situated countries.

The stagnant economic condition of the Philippines in the last decade of the nineteenth century is indicated by the dead level of foreign trade which existed through that period (see Chart XXXVI). The economic advance of the past decade is likewise indicated by an increase in foreign trade, never before approached in the history of the Philippines. It has been occasioned by the removal of industrial restrictions and encouragement to economic independence for the individual and by the opening of a market (the United States) for export products. Agriculture has been most affected, but manufacture (both factory and household), forestry, mining, and commerce have also progressed. The industrial growth of the Philippines will continue and will be based on its natural resources, its labor supply, and the amount of available capital.

Present Economic Tendencies

Household manufacture dependent on agriculture will persist with the peasant-proprietor and share-tenant systems. The tendency is toward commercialism and the commission system, and the perfecting of old articles and the introduction of new wares for the United States market.

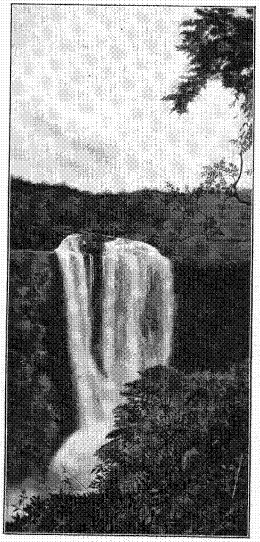
The growth of factories will occur in the larger ports of entry. At the present time the Philippines are hampered by lack of coal supply, or other means of obtaining power. The Spaniards began to search for gold when they occupied the Islands and later interested themselves in other minerals. Gold mining became very important after American occupation, but until recent times was rather speculative. At present there are some successfully operated gold mines and dredging properties. Should "bonanza strikes" be made in any of the Philippine mining regions, the resultant "rush" might open up certain sparsely populated regions, just as California, Australia, and Alaska were settled. There are other minerals besides gold in the Philippines, and interest has



POWER — COAL IN BARGES, UNITED STATES

From Brigham's "Commercial Geography"

also turned to them. Copper, iron, and materials for cement (so much of which is now imported) exist in largest amounts. Their utilization and the growth of factories here depend upon a local supply of coal.



POWER — BOTACAN FALLS

Coal has been discovered in several localities in the Islands, and some of it has been declared as good as the imported Japanese coal, upon which the Philippines now largely depend. As yet the attempts to develop the deposits have not been successful. A source of power from which electricity can be generated for factories may be found in the waterfalls and rapids not seriously affected by the dry season. The mineral oils thus far discovered have been of such high grade as to indicate that the petroleum would be too valuable to burn as crude fuel.

In the immediate future expansion of factories will probably be along the lines already followed — the production of goods for domestic consumption, such as matches and cottons, and the working up of raw materials, such as abaca into rope and copra into coconut oil.

In forestry, capitalistic methods of large production will soon supply domestic demands, and export will follow.

In agriculture the tendency to large estates in certain localities will probably be offset by the general desire of Filipinos to become independent small farmers. It may be that ultimately the creation of educated professional and artisan classes will result in a movement away from the land and the consolidation of small plots into larger holdings. On large and small holdings better methods and machinery are gradually obtaining. The agricultural laborer is receiving economic independence and greater incentive to produce, and the old bondage forms are breaking down under education and enlightenment.

Greater production is taking place under the impetus of a profitable market in the United States.[1] The value of that market and of the Filipino as an agricultural laborer is being recognized in increased capitalistic agriculture. Foreign capital, particularly from the United States, is being invested in large estates purchased from private owners or leased from the government.

Increased commercial product, thus created, is being moved by an improved domestic transportation system; better steamer connections are being made with foreign countries.

The Philippines are a country of great potentialities. Modern methods, labor economically free, and sufficient capital are resulting in wider and better use of the abundant natural resources and in greater production of wealth.

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[1] The United States annually imports over $600,000,000 worth of raw tropical products.

APPENDIX I

TABLES OF EQUIVALENT WEIGHTS AND MEASURES[1]

[Conforming to Act No. 1519 of the Philippine Commission]

CURRENCY

₱1 Philippine Currency = $0.50 United States Currency

LENGTHS

Units	Inches to millimeters	Millimeters to inches	Inches to centimeters	Centimeters to inches	Feet to meters	Meters to feet	Yards to meters	Meters to yards	Miles to kilometers	Kilometers to miles
1	25.4001	0.03937	2.54001	0.3937	0.304801	3.28083	0.914402	1.093611	1.60935	0.62137
2	50.8001	0.07874	5.08001	0.7874	0.609601	6.56167	1.828804	2.187222	3.21869	1.24274
3	76.2002	0.11811	7.62002	1.1811	0.914402	9.84250	2.743205	3.280833	4.82804	1.86411
4	101.6002	0.15748	10.16002	1.5748	1.219202	13.12333	3.657607	4.374444	6.43739	2.48548
5	127.0003	0.19685	12.70003	1.9685	1.524003	16.40417	4.572009	5.468056	8.04674	3.10685
6	152.4003	0.23622	15.24003	2.3622	1.828804	19.68500	5.486411	6.561667	9.65608	3.72822
7	177.8004	0.27559	17.78004	2.7559	2.133604	22.96583	6.400813	7.655278	11.26543	4.34959
8	203.2004	0.31496	20.32004	3.1496	2.438405	26.24667	7.315215	8.748889	12.87478	4.97096
9	228.6005	0.35433	22.86005	3.5433	2.743205	29.52750	8.229616	9.842500	14.48412	5.59233

AREAS

Units	Square inches to square centimeters	Square centimeters to square inches	Square feet to square decimeters	Square decimeters to square feet	Square yards to square meters	Square meters to square yards	Square miles to square kilometers	Square kilometers to square miles	Acres to hectares	Hectares to acres
1	6.452	0.1550	9.290	0.10764	0.836	1.196	2.5900	0.3861	0.4047	2.471
2	12.903	0.3100	18.581	0.21528	1.672	2.392	5.1800	0.7722	0.8094	4.942
3	19.355	0.4650	27.871	0.32292	2.508	3.588	7.7700	1.1583	1.2141	7.413
4	25.807	0.6200	37.161	0.43055	3.344	4.784	10.3600	1.5444	1.6187	9.885
5	32.258	0.7750	46.452	0.53819	4.181	5.980	12.9500	1.9305	2.0234	12.385
6	38.710	0.9300	55.742	0.64583	5.017	7.176	15.5400	2.3166	2.4281	14.246
7	45.161	1.0850	65.032	0.75347	5.853	8.372	18.1300	2.7027	2.8328	17.297
8	51.613	1.2400	74.323	0.86111	6.689	9.568	20.7200	3.0888	3.2375	19.768
9	58.065	1.3950	83.613	0.96875	7.525	10.764	23.3100	3.4749	3.6422	22.239

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[1] By Dr. Alvin J. Cox, Bureau of Science.

MASSES

Units	Avoirdupois pounds to kilograms	Kilograms to avoirdupois pounds	Quintals to avoirdupois pounds	Metric tons to avoirdupois pounds	Arrobas to kilograms	Kilograms to arrobas	Piculs (or picos) to kilograms	Kilograms to piculs (or picos)
1	0.45359	2.20462	220.46	2,204.6	11.500	0.0870	63.250	0.01581
2	0.90719	4.40924	440.92	4,409.2	23.000	0.1739	126.500	0.03162
3	1.36078	6.61387	661.39	6,613.9	34.500	0.2609	189.750	0.04743
4	1.81437	8.81849	881.85	8,818.5	46.000	0.3478	253.000	0.06324
5	2.26796	11.02311	1,102.31	11,023.1	57.500	0.4348	316.250	0.07906
6	2.72156	13.22773	1,322.77	13,227.7	69.000	0.5217	379.500	0.09487
7	3.17515	15.43236	1,543.24	15,432.4	80.500	0.6087	442.750	0.11068
8	3.62874	17.63698	1,763.70	17,637.0	92.000	0.6956	506.000	0.12649
9	4.08233	19.84160	1,984.16	19,841.6	103.500	0.7826	569.250	0.14230

CAPACITIES

Units	Gallons to liters	Liters to gallons	Bushels to hectoliters	Hectoliters to bushels	Gantas to liters	Liters to gantas	Cavans to liters	Liters to cavans
1	3.78543	0.26417	0.35239	2.8377	3	0.33	75	0.0133
2	7.57087	0.52834	0.70479	5.6755	6	0.67	150	0.0267
3	11.35630	0.79251	1.05718	8.5132	9	1.00	225	0.0400
4	15.14174	1.05668	1.40957	11.3510	12	1.33	300	0.0533
5	18.92717	1.32085	1.76196	14.1887	15	1.67	375	0.0667
6	22.71261	1.58502	2.11436	17.0265	18	2.00	450	0.0800
7	26.49804	1.84919	2.46675	19.8642	21	2.33	525	0.0933
8	30.28348	2.11336	2.81914	22.7019	24	2.67	600	0.1067
9	34.06891	2.37753	3.17154	25.5397	27	3.00	675	0.1200

APPENDIX II

[Figures on which certain of the charts are based]

TABLE A

PHILIPPINE RICE IMPORTS

Year	Quantity in 1,000,000 kilos	Value in 10,000 dollars	Year	Quantity in 1,000,000 kilos	Value in 10,000 dollars	Year	Quantity in 1,000,000 kilos	Value in 10,000 dollars
1877	23	106	1889	85	386	1901	178	549
1878	23	136	1890	71	157	1902	216	657
1879	59	249	1891	72	182	1903	307	1006
1880	13	47	1892	62	107	1904	329	1154
1881	5	29	1893	41	62	1905	255	745
1882	9	50	1894	44	56	1906	138	437
1883	54	143	1895	11	22	1907	112	366
1884	108	283	1896			1908	162	586
1885	42	123	1897			1909	137	425
1886	63	204	1898			1910	184	532
1887	79	181	1899	58	193	1911	203	656
1888	82	199	1900	109	311	1912	260	1056

TABLE B

ABACA EXPORTS

Year	Quantity in kilos	Value	Price per kilo (cents gold)	Year	Quantity in kilos	Value	Price per kilo (cents gold)
1877	37,291,312	$ 3,221,699	8.6	1894	96,497,799	$ 7,240,938	7.5
1878	45,481,896	3,599,013	7.9	1895	107,333,951	6,521,509	6.1
1879	39,443,414	3,332,698	8.4				
1880	50,850,779	4,820,058	9.4	1899	59,840,368	6,185,293	10.3
1881	59,388,459	7,908,874	13.3	1900	76,708,936	11,393,883	14.8
1882	45,688,865	6,102,996	13.3	1901	112,215,168	14,453,110	12.8
1883	49,154,803	6,583,252	13.3	1902	109,968,792	15,841,316	14.4
1884	50,775,102	6,236,393	12.2	1903	132,241,594	21,701,575	16.4
1885	53,072,265	5,495,300	10.3	1904	131,817,872	21,794,960	16.5
1886	48,243,691	4,337,838	8.9	1905	116,732,848	22,146,241	19.
1887	74,382,803	8,157,310	10.9	1906	112,165,384	19,446,769	17.3
1888	81,690,267	8,105,289	9.9	1907	114,701,320	21,085,081	18.3
1889	72,210,738	10,399,783	14.4	1908	115,829,080	17,311,808	14.9
1890	47,229,770	6,927,249	14.6	1909	149,991,866	15,833,577	10.5
1891	84,908,002	10,327,905	12.1	1910	170,788,629	17,404,922	10.1
1892	70,491,481	6,884,515	9.7	1911	165,649,626	16,141,340	9.7
1893	93,742,824	7,698,420	8.2	1912	154,047,000	16,283,510	10.5

TABLE C

PARTICULARS OF SHIPMENTS OF COPRA [1]

(Not including South Sea, Zanzibar, and other countries of production, for which statistics are not available)

1896–1910

Year	Java	Macassar	Sangir, Menado, and Gorontalo	Padang	Singapore and Penang	Ceylon	Manila	Malabar	Total
	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
1896	19,511	8,770	6,000	5,778	39,440	3,677	33,468		116,644
1897	5,630	4,076	4,000	2,678	30,593	7,831	46,290		101,098
1898	3,086	8,226	6,000	5,515	35,363	37,192	15,094		110,476
1899	46,011	12,012	10,486	3,900	52,182	23,905	12,253		160,749
1900	35,257	13,982	10,296	5,487	28,214	18,059	57,361		168,656
1901	27,688	12,151	10,482	4,737	26,111	21,916	28,854		131,939
1902	45,129	28,045	17,698	5,364	50,490	18,740	45,030		210,496
1903	15,406	9,799	11,653	6,231	52,420	34,713	78,874		209,096
1904	29,716	9,125	11,746	6,120	42,070	33,578	38,383		170,738
1905	107,709	25,961	19,514	6,580	58,915	17,740	49,715		286,134
1906	52,000	9,641	14,481	6,638	39,215	21,212	57,900		201,087
1907	69,666	17,248	16,080	8,694	55,120	17,398	53,531		237,737
1908	94,740	21,591	24,047	11,927	76,550	36,457	89,698	12,331	367,341
1909	68,217	19,256	20,706	9,390	71,105	34,520	103,669	28,026	354,889
1910	100,578	30,880	27,298	10,479	102,610	35,713	118,493	24,146	450,197

TABLE D

PHILIPPINE COPRA EXPORTS [2]

Fiscal year	Kilos	Value	Price per kilo
1899	14,047,239	$ 656,870	$0.046
1900	37,081,405	1,690,897	.045
1901	52,529,878	2,648,305	.050
1902	19,686,785	1,001,656	.050
1903	97,629,523	4,472,679	.045
1904	54,132,951	2,527,019	.046
1905	37,556,575	2,095,352	.055
1906	66,157,993	4,043,115	.061
1907	49,081,978	4,053,193	.082
1908	76,419,677	5,461,680	.071
1909	105,564,781	6,657,740	.063
1910	115,284,851	9,153,951	.079
1911	115,602,012	9,899,457	.085
1912	169,342,000	16,514,749	.098

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[1] Compiled by L. M. Fischel & Co.

[2] Customs Statistics.

TABLE E

PHILIPPINE SUGAR EXPORTS[1]

Year	Value	Year	Value	Year	Value
1877	$ 8,309,585	1888	$ 6,274,385	1902	$ 2,761,432
1878	7,496,824	1889	9,098,548	1903	3,955,828
1879	6,846,510	1890	7,266,798	1904	2,668,507
1880	10,265,788	1891	5,698,949	1905	4,977,026
1881	11,035,833	1892	7,766,326	1906	4,863,865
1882	7,972,780	1893	10,370,574	1907	3,934,460
1883	10,546,185	1894	5,474,422	1908	5,664,666
1884	6,013,982	1895	6,068,485	1909	4,373,338
1885	8,646,735	1899	520,935	1910	7,040,690
1886	7,016,348	1900	3,000,501	1911	8,014,360
1887	6,153,511	1901	2,293,058	1912	10,400,575

TABLE F

TOTAL PHILIPPINE TOBACCO EXPORTS

Year	Quantity in kilos	Price	Year	Quantity in kilos	Price
1854	4,205,163	$1,151,226	1885	6,804,354	$2,291,320
1855	2,523,484	878,390	1886	5,916,066	2,009,095
1856	5,476,729	1,490,131	1887	5,016,762	1,558,260
1857	6,298,243	2,595,462	1888	11,429,456	2,450,552
1858	3,838,303	1,713,477	1889	10,368,794	2,254,881
1860	938,663	1,183,142	1890	10,205,126	2,469,634
1861	1,232,501	1,200,230	1891	10,315,155	2,151,137
1862	3,326,731	1,578,117	1892	13,732,733	2,535,000
1863	3,791,830	2,902,139	1893	12,029,686	2,433,700
1864	2,804,577	1,979,497	1894	8,163,482	1,575,544
1865	3,168,431	3,843,971	1895	11,381,921	2,276,092
1866	3,951,629	4,700,302	1899		2,212,714
1867	4,805,023	4,788,575	1900		2,181,279
1873	2,685,029	2,314,752	1901		2,217,718
1874	4,541,889	3,476,816	1902		2,501,467
1875	5,641,968	3,412,187	1903		1,881,760
1876	701,514	1,089,817	1904		2,013,267
1877	2,165,734	1,175,686	1905		1,996,038
1878	954,600	1,882,479	1906		2,389,890
1879	10,706,001	1,190,779	1907		3,429,194
1880	2,118,571	2,228,082	1908		2,714,546
1881	2,784,334	717,031	1909		2,792,253
1882	7,343,390	2,348,162	1910		4,637,495
1883	4,160,084	2,587,948	1911		3,605,567
1884	2,046,563	1,586,004			

[1] Census Statistics.

TABLE G

EXPORTS OF PHILIPPINE TOBACCO LEAF

Year	Quantity in kilos	Value	Price per kilo	Year	Quantity in kilos	Value	Price per kilo
1854	4,205,163	$ 789,720		1885	5,831,379	$1,285,567	$0.220
1855	2,523,484	467,610		1886	5,099,618	759,542	.148
1856	5,476,729	1,136,161		1887	4,289,043	640,366	.149
1857	6,298,243	1,455,171		1888	9,741,651	1,341,040	.137
1858	3,838,303	876,551		1889	9,138,661	1,404,372	.153
1860	938,663	157,382		1890	8,819,589	1,321,073	.149
1861	1,232,501	226,963		1891	9,068,318	1,259,230	.138
1862	3,326,731	1,086,018		1892	12,136,370	1,553,811	.128
1863	3,791,830	1,086,018		1893	10,744,593	1,464,091	.136
1864	2,804,577	1,241,977		1894	7,019,117	702,641	.100
1865	3,168,431	2,216,843		1895	10,059,422	1,111,716	.110
1866	3,951,629	2,540,571		1898	2,016,757	450,750	.223
1867	4,805,023	2,999,117		1899	6,059,115	917,536	.151
1873	2,685,029	1,414,686	$0.526	1900	8,316,277	989,439	.118
1874	4,541,889	2,210,633	.486	1901	8,136,127	956,451	.117
1875	5,641,968	2,471,432	.438	1902	9,909,592	824,650	.083
1876	701,514	369,972	.527	1903	9,410,887	913,815	.097
1877	2,165,734	356,437	.164	1904	8,682,859	1,031,832	.118
1878	954,600	498,832	.522	1905	7,868,286	1,011,612	.128
1879	10,706,001	129,030	.012	1906	9,738,885	1,468,839	.150
1880	416,115	331,462	.796	1907	13,668,275	1,973,305	.144
1881	1,513,185	593,941	.392	1908	10,552,890	1,592,123	.150
1882	5,658,615	1,960,123	.346	1909	10,729,159	1,674,033	.156
1883	3,366,139	1,242,138	.369	1910	9,920,054	1,629,820	.164
1884	1,246,470	483,565	.387	1911	12,487,152	1,868,723	.149

TABLE H

PHILIPPINE CIGAR EXPORTS

Fiscal year	To all Countries			To the United States		
	Thousands	Value	Price per thousand	Thousands	Value	Price per thousand
1899	167,991	$1,294,653	$ 7.71	1,810	$ 7,162	$ 3.96
1900	219,098	1,189,942	5.43	532	1,885	3.54
1901	149,496	1,250,175	8.36	1,335	5,027	3.77
1902	225,420	1,666,822	7.39	464	8,539	18.40
1903	119,721	947,246	7.91	332	3,866	11.64
1904	104,803	968,869	9.24	96	1,795	18.70
1905	106,571	968,022	9.08	728	6,790	9.33
1906	93,136	904,250	9.71	1,288	23,405	18.17
1907	116,719	1,051,621	9.01	1,593	26,067	16.36
1908	117,564	1,084,078	9.22	1,365	21,781	15.96
1909	116,278	1,083,702	9.32	2,696	43,818	16.25
1910	196,192	2,973,630	15.16	88,181	1,992,909	22.60
1911	132,217	1,700,712	12.86	27,936	717,907	25.70
1912	175,320	2,660,061	15.17	71,973	1,619,326	22.50

TABLE I

Value of Imports and Exports of the Philippine Islands for the Calendar Years 1872—1912 in 100,000 Dollars

Year	Imports	Exports	Total	Year	Imports	Exports	Total
1872	230	170	400	1891	168	209	377
1873	135	240	375	1892	163	192	355
1874	138	174	312	1893	159	222	381
1875	119	185	304	1894	142	165	307
1876	110	136	246	1895	131	188	319
1877	184	155	339	1899	131	146	277
1878	157	158	315	1900	206	198	394
1879	159	166	325	1901	303	232	535
1880	229	211	440	1902	320	245	565
1881	185	219	404	1903	330	332	662
1882	190	184	374	1904	332	302	634
1883	186	230	416	1905	309	324	633
1884	186	198	384	1906	258	319	577
1885	160	205	365	1907	288	337	625
1886	157	201	358	1908	309	328	637
1887	135	194	329	1909	278	310	588
1888	157	194	351	1910	371	397	768
1889	182	257	439	1911	498	398	896
1890	163	216	379	1912	545	503	1048

Note. Unless otherwise stated, the figures in Appendix II are taken from the Philippine Census, 1903, and the *Annual Report of the Insular Collector of Customs*, 1912.

TABLE J

Philippine Foreign Trade by Countries

(In thousands of dollars)

TOTAL IMPORTS

	1899	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912
United States . . .	1,151	1,658	2,856	3,787	3,773	4,633	5,761	4,334	5,155	5,079	4,693	10,798	19,819	20,770
United Kingdom . .	2,247	3,946	6,956	4,401	4,299	4,128	4,848	5,224	6,458	6,110	5,409	5,657	6,290	5,509
French East Indies .	——	——	1,914	3,098	4,599	9,205	5,969	3,854	3,474	5,746	4,275	5,455	7,416	9,575
Australasia	173	544	442	488	589	1,101	1,366	1,524	1,612	2,046	2,499	2,302	2,720	3,126
Japan	119	260	806	775	607	803	1,018	657	1,626	1,112	1,441	2,242	2,475	3,234
Germany	851	1,211	2,135	2,147	1,869	1,601	1,499	1,361	1,655	1,934	1,731	1,978	2,360	2,389
China and Hongkong	5,569	8,338	6,681	11,683	5,132	3,617	3,150	2,959	3,066	2,963	2,619	3,206	2,891	2,777
Spain	2,518	2,091	2,167	2,219	2,417	2,009	1,931	1,787	1,757	1,654	1,340	1,387	1,409	1,254
France	226	486	1,679	1,480	1,154	1,180	832	834	851	821	947	1,032	1,214	1,276
Other	264	2,067	4,640	1,951	8,539	4,944	4,505	3,265	3,132	3,453	2,840	3,010	3,239	2,640
Total	13,118	20,601	30,276	32,029	32,978	33,221	30,879	25,799	28,786	30,918	27,794	37,067	49,833	54,550

TOTAL EXPORTS

	1899	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912
United States . . .	3,541	3,635	2,572	7,872	9,503	11,103	15,668	11,579	12,079	10,332	10,254	18,794	16,814	21,619
United Kingdom . .	2,686	6,241	10,705	8,280	7,400	10,123	8,291	7,500	8,749	8,871	5,847	5,844	7,548	7,481
France	534	1,392	1,934	955	3,004	2,127	1,492	2,703	2,690	3,906	4,261	6,484	6,686	10,071
Spain	1,078	1,320	1,655	870	758	966	1,434	1,803	1,790	1,720	1,990	1,973	2,179	2,485
Hongkong and China	3,130	5,859	2,716	6,094	6,254	2,782	3,368	2,959	4,587	3,965	4,239	2,259	1,545	1,407
Germany	52	98	82	75	128	107	130	459	2,690	602	492	891	647	1,752
Other	3,619	1,276	3,558	399	6,103	3,018	1,973	4,916	1,137	3,433	3,961	3,472	4,359	5,504
Total	14,640	19,821	23,222	24,545	33,150	30,226	32,356	31,919	33,722	32,829	31,044	39,717	39,778	50,319

TABLE K

PHILIPPINE IMPORTS FROM ALL SOURCES[1]

ARTICLES	1907		1908		1909		1910		1911		1912	
	Amount	Per cent of total	Amount	Per cent of total	Amount	Per cent of total	Amount	Per cent of total	Amount	Per cent of total	Amount	Per cent of total
Cotton and manufactures	$ 8,416,246	28.3	$ 8,011,834	26.0	$ 6,944,978	25.0	$ 8,522,307	23.1	$10,395,480	20.8	$ 9,344,945	17.1
Iron and steel, and manufactures . .	2,544,992	8.7	2,164,707	7.0	1,933,032	7.0	3,305,695	8.9	5,887,227	11.8	6,031,603	11.1
Meat and dairy products	1,704,486	5.7	2,029,650	6.5	2,176,943	7.8	2,377,466	6.4	2,900,028	5.8	3,541,274	6.4
Flour.	889,174	3.1	1,044,570	3.3	1,172,322	4.2	1,534,442	4.1	1,422,279	2.9	1,761,398	3.2
Books, etc.	116,207	0.4	165,193	0.5	166,750	0.6	267,589	0.7	497,106	1.0	355,520	0.7
Leather and manufactures	479,134	1.6	671,962	2.3	494,138	1.8	760,463	2.1	994,191	2.0	1,025,807	1.9
Illuminating oils . .	790,447	2.6	806,112	2.6	614,334	2.2	1,142,250	3.1	998,678	2.0	1,207,180	2.2
Paper and manufactures	508,754	1.7	526,434	1.7	457,543	1.6	638,833	1.7	816,913	1.7	758,044	1.4
Rice	3,662,493	12.3	5,861,256	18.9	4,250,223	15.3	5,321,962	14.3	6,560,630	13.1	10,569,949	19.3
All other products .	10,553,889	35.6	9,637,027	31.2	9,584,219	34.5	13,190,918	35.6	19,361,190	38.9	19,954,260	36.7
	$29,665,822	100	$30,918,745	100	$27,794,482	100	$37,061,925	100	$49,833,722	100	$54,549,980	100

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[1] Compiled from statistics in the Bureau of Customs.

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